

# THE IRON AGE

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## Power Plant for Upper Michigan Mines

High-Head Hydroelectric Development on the  
Marquette Range for the Cleveland-Cliffs Iron  
Company Using Three Types of Pipe Line

The properties and operations of the Cleveland-Cliffs Iron Company in the Lake Superior iron mining district are second only to those of the United States Steel Corporation's Oliver Iron Mining Company. The principal mines of this company are located on the Marquette Range and are subdivided into four natural districts located at Ishpeming, Negaunee, North Lake and Princeton. The company also controls the charcoal blast furnace operation at Marquette. The trend of operating management toward greater economies has been emphasized increas-

North Lake, and 17 miles southeast to a sub-station at Princeton. At Ishpeming and North Lake power has been obtained in the case of each mine from isolated steam plants. At the Maas mine at Negaunee and at the Princeton sub-station 1000-kw steam turbo-generator plants were installed. The plan to supply power from a single hydroelectric developing station was dependent upon suitable water power and involved the inclusion of the turbo-generator sets already installed. The steam-driven air compressors which were installed are for the most part



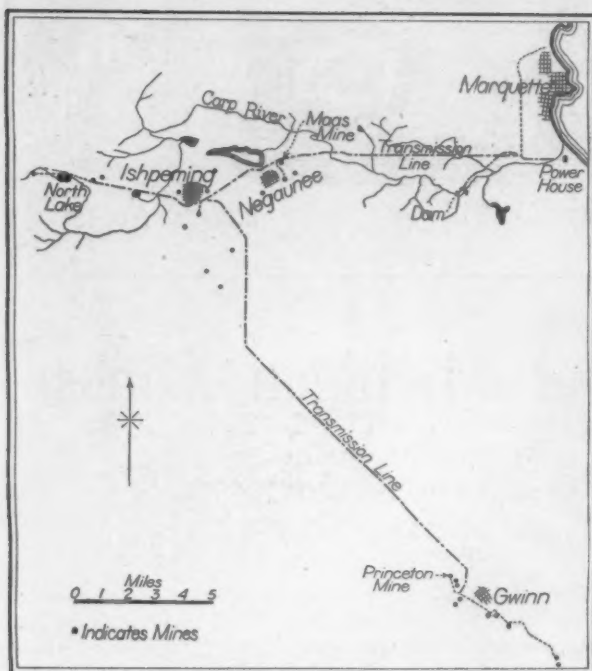
Intake Dam from Upstream Side, Showing Retaining Walls for Embankments and Gate Structure for Entrance to Pipe Line.

ingly as it has become necessary to develop ore bodies at greater depth and to utilize deposits carrying less iron. The question of power cost in the general economy of operation is fundamental. The effort to cheapen the cost of power has been directed toward the development of hydroelectric plants and low-pressure steam turbines.

The general location of the mining districts requiring power service in this instance is shown on the map on page 1078. The distances involved are approximately 10 miles from the power station to the Maas mine sub-station at Negaunee, 4 miles west to a sub-station at Ishpeming, 4 miles still further west to a sub-station at

of that type where the air cylinder is between the steam end and the flywheel, so that by disconnecting the steam end and connecting the compressor band wheel by a rope drive to a motor interchangeable operation is established.

The Carp River is made use of as the source of power. The investigations upon which the adaptability of this stream for the power requirements of the company was established extended over many months. It was found that the drainage area of the river above the probable location of the intake dam was about 80 square miles, with an average flow of 0.4 second-foot per square mile of drainage area, or 32 second-feet during an average month.



Map Showing Location of Dam, Power Station and Transmission Lines to the Mining District at Ishpeming, Negaunee, North Lake and Princeton

This rate of flow was somewhat higher than from streams in this district, owing to the pump discharge from the mines.

The power plant design was calculated to utilize a stream flow such as could be relied on seven months of the year, the Maas mine and Princeton steam turbine plants to be used as auxiliaries during the dry season. During the seven months of the year of greatest flow an average of 1.25 second-feet was shown. It was thus calculated to develop storage during these months for equalizing the flow during the rest of the year. The design of the Carp power plant was thus assumed on the basis of this flow of 1.25 second-feet per square mile of drainage area, or for the total drainage area, on the basis of 100 second-feet, while the waterways and apparatus were designed for a maximum discharge of 152 second-feet. This established the load factor of the plant at the ratio of 100 to 152, or 66 per cent.

The total fall in the river is 622 ft. and the average working head 580 ft. On the basis of the low-water flow of 32 second-feet mentioned above, 1680 hp. could be generated continuously, and at peak load 2550 hp. On the basis of an average discharge of 100 second-feet, 5250 hp. could be generated continuously, and 7000 hp. under peak load conditions. Allowing for a 15 per cent. loss in transmission a peak load of 6000 hp. would then be available at delivery points. On the basis of the above 66 per cent. load factor

the plant would develop the equivalent of 26,500,000 kw-hr. during a year of 330 days.

The scheme of power generation involved in its consideration, operation with and without a steam-power auxiliary plant for the development of full capacity at low-water and also with and without a storage reservoir. The available storage back of the intake dam, amounting to approximately 10,000,000 cu. ft., would be sufficient to average up the daily and weekly discharge of the steam, but to obtain the maximum capacity throughout the full year instead of seven months a storage reservoir will be necessary at some future time.

From an engineering standpoint the construction of the dam, pipe line and tail race include many interesting features. The beginning of work dated from February 20, 1911, and at that time a land looker was sent to locate the power house site and to ascertain the proper foundation locations by drilling. Power was turned on in the completed plant February 16, 1912. A view of the intake dam in the upstream side is shown among the illustrations. The retaining walls of the dam are of special design because of the nature of one embankment which required the building of core wall anchors. Behind this an extensive back fill was necessary. The concrete work on the dam was completed with unusual economy owing to the location of a gravel bed discovered immediately adjoining the dam site, so that the concrete mixing plant could be located within tramping distance of the gravel and at the same time on an elevation sufficiently near the dam to permit a gravity discharge of the concrete into the forms.

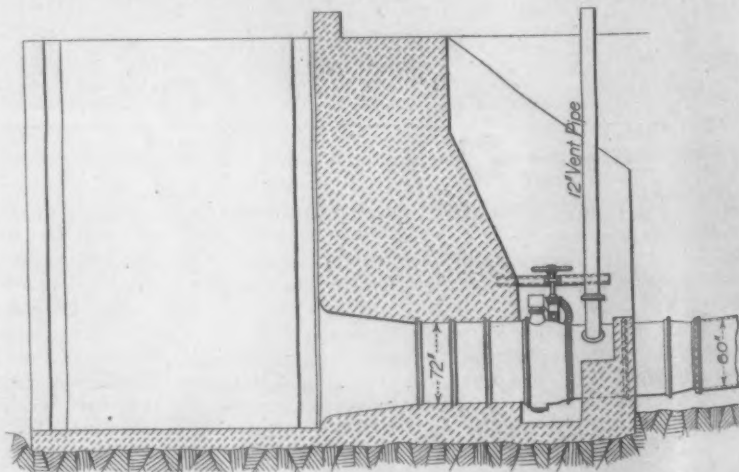
The pipe line is built up of 10,000 ft. of 60-in. Pacific



Pacific Coast Wood Pipe Line, Showing How the Pipe Conforms to the Ground Contour

coast wood pipe, about 9000 ft. of 60 and 66-in. lock-bar steel pipe, and 2000 ft. of seamless welded high-pressure pipe of German manufacture made by Thyssen & Co., Mülheim a.d. Ruhr, Germany. The wood pipe is used at all points where the head does not exceed 170 ft. The lock-bar pipe is used where the head exceeds that figure and over crossings, down to the 16-ft. surge tank 125 ft. high. From the surge tank to the generating station, a distance of 2000 ft., the high-pressure welded pipe is used.

The pipe line survey ran through an unbroken country and to avoid the building



Detail of Main Pipe Line Connection at Intake Dam

of a haulage road for handling the pipe an ingenious plan was devised. At two points the line of pipe is crossed by the tracks of the Duluth, South Shore & Atlantic Railroad. Pipe was delivered at these crossings, and in the trenches dug for the laying of the pipe tram rails were laid. On these the pipe was hauled back in the trench as indicated in one of the pictures, the tracks being removed as the pipe was laid down.

The lock-bar pipe is made by the East Jersey Pipe Company, New York City, and possesses a form of longitudinal joint between the plates that form the pipe calculated to offer minimum resistance to the flow of water. It is made usually in 30-ft. lengths, and as compared with riveted steel pipe is said to show 10 to 20 per cent. less resistance. The form of joint is indicated in accompanying illustrations, which show the use of the lock-bar before and after closing the joint. In addition to this form of joint, which is emphasized as adding much to the strength of the pipe line, the lengths of the pipe are made with a slight taper, so that the small end, the diameter of which coincides with the diameter of the pipe specified, fits into the end of the next section. The circumferential joint is riveted and caulked.

In manufacture the longitudinal edges of the plate are planed to the proper dimension and the edges are upset to a sufficient degree to form the necessary shoulder for engaging the lock-bar. The plates after being crimped to the proper radius for the pipe are assembled in the lock-bars, which are then pressed down over the upset edges of the plates by a hydraulic press exerting a pressure of 350 tons or more per lin. ft. of pipe. In the specifications covering lock-bar pipe issued by the East Jersey Pipe Company it is stipulated that each section shall be tested in a hydraulic testing machine to at least  $1\frac{1}{2}$  times the working pressure, which pressure shall be maintained until the inspection has been made the entire length of the lock-bar joint. The pipe section, heated to the proper temperature, is then put vertically into a bath of mineral rubber coating maintained at a temperature of about 350 deg. F., to put a coating of  $\frac{1}{32}$  in. thickness on the metal.

Particular interest



View at Pipe Unloading Station, Showing Method of Tramping in the Pipe Trench Instead of Building a Road



Concrete Anchor and Reinforcement of Lock-Bar Pipe, Where Contour Changes Sharply



View Showing the Thyssen High Pressure Welded Steel Pipe with Flare for the Joint

attaches to the use and design of the Thyssen welded pipe. This pipe is made with a flare at the end, such that the riveted heads are out of the line of flow when the pipe is put together. For high-pressure work the number and size of the rivets would be sufficiently great to introduce an appreciable amount of friction if the heads protruded into the flow of water. The pipe is also unique in that it is a fitted job, all of the riveted holes being drilled and marked for exact fit. It is also interesting to note that this pipe was imported and delivered on the ground at a cost less than that of American riveted pipe suitable for the same pressures.

Thyssen & Co., in enumerating the advantages of the welded steel pipe, claim that it is 25 to 30 per cent. stronger than riveted pipe of the same thickness of plate. Owing to this circumstance the weight of the pipe is lighter than the weight of riveted pipe of the same strength, although it is emphasized that this difference in weight is further increased, as the riveting and laps add 15 to 20 per cent. in weight. Likewise emphasis is placed on the added carrying capacity of the welded pipe through the elimination of longitudinal lines of rivet heads and of the laps of riveted seams, and it is felt that the absence of seams does not lend the pipe open to tendency for leakage through stresses developed in handling the pipe in transportation or in laying. The

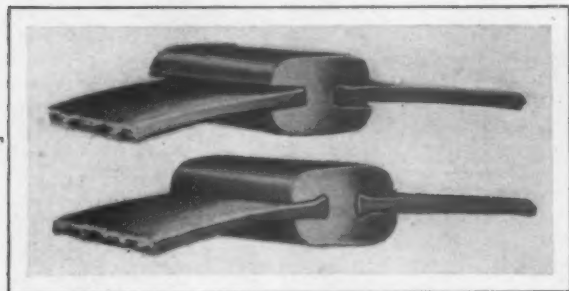




View of Tail Race from Power Station Illustrating an Economical Steam Shovel Excavation Without Tramming

rivet holes are drilled by electric drilling machines with the ends of the two consecutive lengths put one into the other, so that when they are brought together at the final location a proper fit may be expected. The welding is done with water gas.

The power house is a fireproof steel frame brick structure and the generating equipment consists of two 4000-hp. Francis type turbines operating at 1200 r.p.m. with governor control and each direct connected to a 2500-kw. three-phase, 60-cycle, 2300-volt alternator with



Lock Bar Pipe Joint Before and After Closing

direct coupled exciter. These are understood to be the highest head reaction type turbines in operation in this country. The transformers are 2300 to 30,000 or 60,000-volt, step-up type, complete with switchboard. The plan of the power station and the layout of these turbines and generators is shown in the accompanying plan.

A view of the tail race from the power station is shown as an example of economical steam shovel work. This tail race is a 14-ft. cut on which a contractor, estimating for the usual tramming methods, figured a cost of 35 cents a cubic yard. A method was devised whereby a cost of 17 cents per yard was obtained by taking three steam shovel cuts and eliminating the tramming entirely. For precautionary purposes a double circuit transmission line is installed. Viele, Blackwell & Buck, New York City, were the consulting engineers of the hydroelectric development.

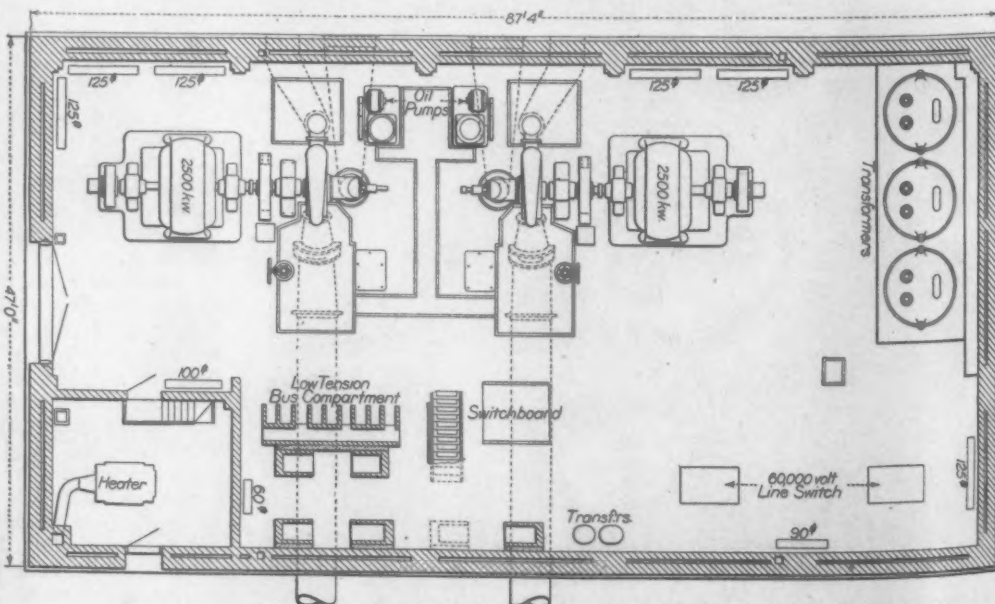
### The Product of a Steel-Hardening Process

The accompanying reproduction of a photograph of the section of a tooth of a gear is presented to show the results of the application of the Stroh steel-hardening process, which has been developed by the Stroh Steel Hardening Company, House Building, Pittsburgh, Pa. It is explained that a layer of alloy is superimposed on the wearing surfaces of the steel to a depth as great as the thickness of the material worn away in practice. It is explained that this layer is not an insert but an integral part of the casting. The process, the particulars of which are not divulged, has been developed by W. Y. Stroh, formerly chemical engineer for Robert W. Hunt & Co., Chicago. J. L. Kendall is president; Mr. Stroh, vice-president and treasurer and F. M. Wilhelm, secretary.



Fracture of an Involute Tooth

**Lathe Dog.**—To prevent the unguarded set screw of an ordinary dog from catching in the clothing of a machinist while he is filing, a new type has been brought out by Elmer J. Michaud, South Windham, Conn. This dog is shaped so that the set screw is guarded, the tail being curved around in front of the screw on the leading side. While affording protection this feature does not affect the convenience of loosening or tightening the set screw.



Plans Power Section of the Cleveland-Cliffs Iron Company



## The Cincinnati Precision Bench Lathe

Details of a New Design in Which Cone Pulleys Have Been Eliminated

A new 8-in. precision bench lathe has been recently brought out by the Cincinnati Precision Lathe Company, Fosdick Building, Cincinnati, Ohio. It was designed by J. M. Tatman and it is understood to differ from others of the same class in that there is no belt pull on the spindle and the cone driving pulleys have been done away with. Fig. 1 is a view of the lathe and details of the driving mechanism are given in Fig. 2.

The lathe has a friction-driven single continuous speed pulley drive. Heavy and practically continuous spindle bearings are used to secure sufficient rigidity to do away with chatter under the heaviest cuts. As the belt pull on the spindle, both upward and downward, has been done away with, it is pointed out that the bearings wear uniformly throughout and are not worn elliptical or out of round or out of longitudinal alignment. Another advantage claimed for the elimination of belt pull is that the bearings do not heat at high speed and in this way a closer adjustment of the spindle bearings is possible.

Referring to Fig. 2 which gives the details of the driving mechanism, the power from the driven friction disk *a* is transmitted to the spindle *b* through mitre gears *c* and *d* running in oil and keyed respectively to the friction disk shaft *e* and the spindle shaft *f*. These gears, it is emphasized, are so designed that they will mesh perfectly with no back lash and when the wear becomes perceptible it can be taken up so that smooth and positive transmission of power and the absence of chatter in handling the work from the heaviest to the most delicate cuts is said to be secured.

The driving pulley which runs at a constant speed is large in diameter and has a wide face and eliminates the narrow belting employed with the cone pulley. The main driving pulley *g* is keyed to a hollow slotted driving shaft, *h*, which contains a rack shaft, *i*. Passing through both shaft members is a common driving key which is inclosed in the driving friction wheel. Thus rack shaft meshes with a pinion wheel attached to a handwheel having a speed indicator on its outer edge. In this way it is possible to

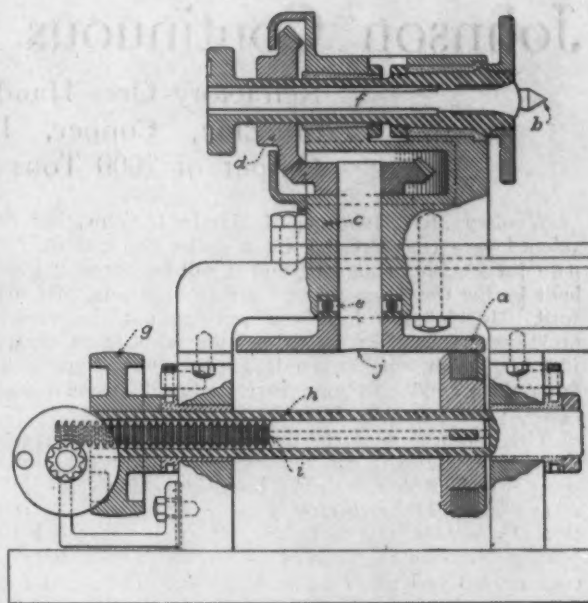


Fig. 2—Details of the Driving Mechanism

heavy and very delicate cuts to be taken on the one machine after the work is in position and thus the field of the precision lathe is widened.

## Canadian Shipbuilding Contracts

The Collingwood Shipbuilding Company, Collingwood, Ont., has been awarded a contract to build a steamer that, it is said, will be the largest on the Canadian register. It will be a steel bulk freighter, 550 ft. long, 58 ft. beam and 31 ft. deep. The steamer is for the Chicago & St. Lawrence Navigation Company and will cost upward of \$400,000.

The Northern Navigation Company, headquarters Collingwood, has ordered a new \$750,000 passenger and freight steamer from the Western Shipbuilding Company, Port

Arthur, for the 1913 season. It is to be 452 ft. in length and 55 ft. beam, with accommodations for 500 first-class passengers.

As a result of congestion of business and labor troubles in England, an order for a full-sized \$140,000 canal steamer has been placed with the Collingwood Shipbuilding Company by the Keystone Transportation Company, at Montreal; and if the company succeeds in turning it out on contract time, September, 1912, this will constitute a record for

shipbuilding in Canada. The new vessel will be 258 ft. long, with 42.6 ft. beam, 20 ft. depth, 800-hp. engines, and a speed of about 10 miles an hour. Its capacity will be about 82,000 bushels of wheat.

**Lubricator Cup Top Lock.**—A simple type of lock for use on the tops of grease or oil cups which are subject to jar has been developed by the F. S. & G. L. Brown Machine Company, Baltimore, Md. The device consists of a piece of spring wire set in the top of the cup and fastened at one end so that it will easily spring down into a slot cut in the rim of the cup as the top is screwed home. It is pointed out that while this lock effectually prevents the top from jarring off it does not interfere with unscrewing the top by hand.

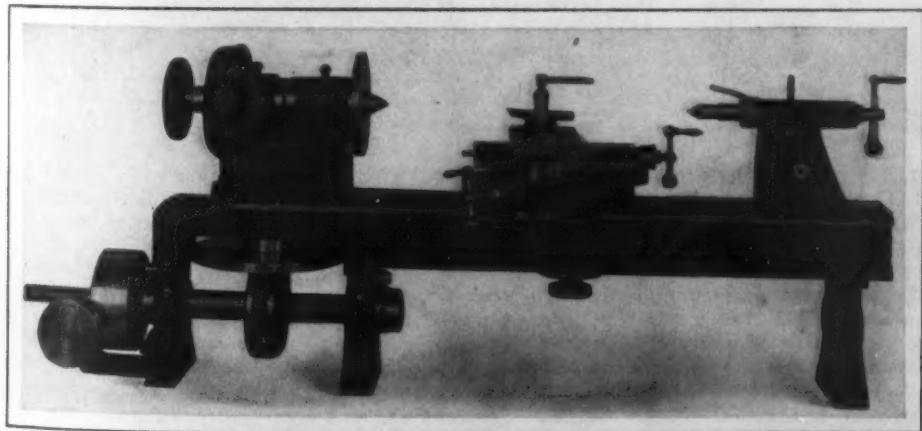


Fig. 1—The Cincinnati 8-In. Precision Bench Lathe Built by the Cincinnati Precision Lathe Company, Cincinnati, Ohio

adjust the friction driving wheel positively, easily and quickly to give any desired speed or immediately reverse the direction of spindle rotation. This driving wheel is shifted across the face of the friction disk to give this variation, the driving key sliding in a slot in the hollow shaft. A depression, *j*, in the center of the friction disk enables the machine to be stopped almost instantaneously without stopping the driving belt. If desired the friction disk can be chamfered at the outer edge so that the machine will come to rest both at the center and the outside of the disk. In this arrangement special emphasis is laid upon the fact that as the disk is the driven member which is the reverse of most friction mechanisms, it is possible to secure the highest power and the slowest speed at the outer edge of the disk where it is most desired. It is also pointed out that the use of this disk enables both

# Johnson Continuous Electric Zinc Furnace

Refractory Ores Handled with High Recoveries of Zinc, Copper, Lead and Silver—Yearly Output of 2000 Tons from a 500-kw. Furnace

Woolsey McA. Johnson, of Hartford, Conn., has developed to a commercial point a continuous electric furnace for smelting zinc ores, and it will be introduced and built by the Continuous Zinc Furnace Company, of Hartford. Mr. Johnson has been working out the various problems involved since 1903 and the result is an electric furnace which smelts zinc-lead-copper ores, producing from them condensed zinc, base lead bullion and copper matte, with a fusible thinly-liquid slag.

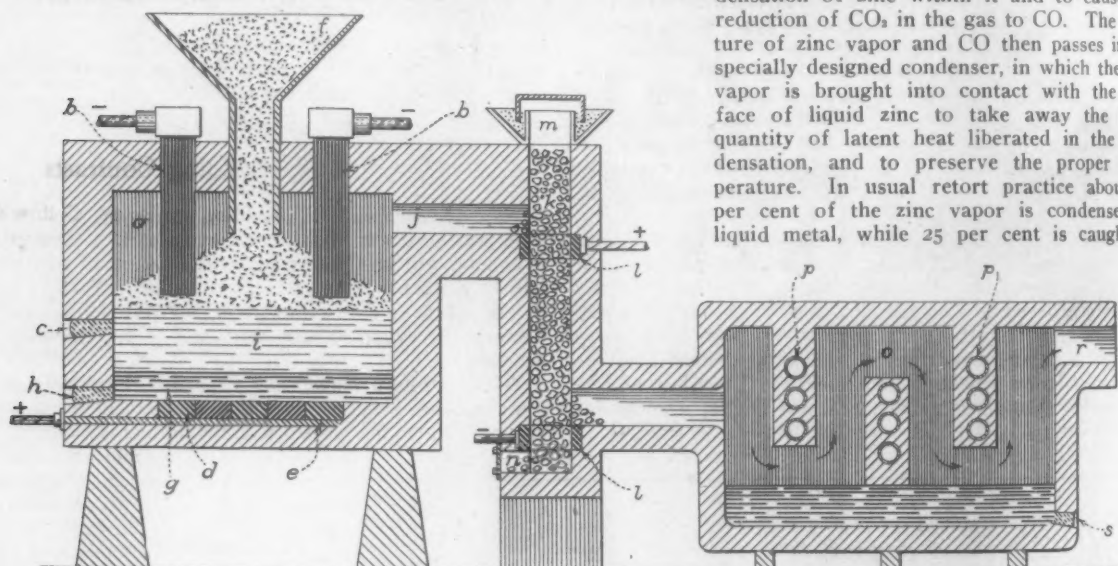
The furnace possesses the advantages of being continuous in its operation and of reducing ores commercially which it has hitherto been impossible to handle successfully. These refractory ores contain so much iron that the retorts are corroded. From this material the Johnson furnace is designed to give high recoveries of copper, lead and silver as well as zinc. The amount of these so-called refractory zinc-lead ores in the world is

It is estimated that the cost of electric power will approximate that of the coal used in present practice.

## Metallurgy of the Johnson Furnace

The metallurgy of the Johnson furnace lies between that of the lead blast furnace and that of the iron blast furnace. The temperature of its melting zone is about 1350 C. as compared with 1200 C. of the lead furnace and 1600 and 1700 C. and over of the blast furnace. Its slag is too low in iron oxide to be practical in a lead furnace and too high in iron oxide to be commercial in an iron furnace. In general, the furnace can be classed as of the buried arc type.

The zinc vapor emanating from the furnace, with a varying percentage of carbon dioxide gas, is passed through a carbonaceous filter, and is kept hot enough by the passage of the electric current to prevent the condensation of zinc within it and to cause the reduction of  $\text{CO}_2$  in the gas to CO. The mixture of zinc vapor and CO then passes into a specially designed condenser, in which the zinc vapor is brought into contact with the surface of liquid zinc to take away the large quantity of latent heat liberated in the condensation, and to preserve the proper temperature. In usual retort practice about 75 per cent of the zinc vapor is condensed to liquid metal, while 25 per cent is caught as



Section of the Johnson Continuous Electric Furnace for Smelting Zinc Ores

very large. In the copper levels of the Butte camp are some 2,000,000 tons. B. B. Thayer, president of the Anaconda Company, is authority for the statement that Butte will take a position in the zinc business comparable to its present position in the copper trade. This statement does not refer specifically to the Johnson process but to the general metallurgical advance expected. And it has been estimated that some \$30,000,000 worth of zinc, or more than is used in the arts, is wasted each year in the slags of the American lead and copper smelters.

There are those familiar with developments in the industry and with the advance represented in the new type of furnace, who consider it within the bounds of probability to expect to see 500-kw. electric zinc furnaces producing 2000 tons of metal per year, the equivalent in capacity of 700 to 800 retorts such as are now in practically universal use.

The metallurgy of zinc has not improved greatly in principle since it had a beginning. It has improved in details, such as the introduction of mechanically operated roasters, regenerative gas furnaces, hydraulically pressed retorts, etc.; but the operative unit is still the small retort, with its limited life, thermal inefficiency and corrodibility, operated by costly and crudely applied hand labor. In the United States to-day some 90,000 of such retorts are making each only about 6000 lb. of metal per year. The development of the electric furnace has proceeded on these grounds—that the extraction of zinc is more perfect than in retorts, the metal is more uniform in quality, the labor cost is less, the capacity for treating a variety of ores is greater, and the control of temperature better.

"blue powder," which must be worked over. In the Johnson furnace 90 per cent of liquid metal is obtained.

If there were not such a protective device as this filter, the carbon dioxide would oxidize superficially the droplets of zinc in the condenser, so preventing them from coalescing, and a large percentage of blue powder would be formed. The losses of values in the liquid slag are also very low, being not over 1 per cent of the zinc contents of the charge. The slags are very low in lead, copper and the precious metals, it being stated that 0.05 per cent Pb, 0.15 per cent Cu, and 0.30 per cent Ag are not at all unusual.

## Furnace Construction and Operation

The details of the furnace are shown in the accompanying cut. The smelting chamber *a* is formed of a refractory material. The carbon electrodes *b* are supported in the upper part of the furnace, their lower ends terminating above the level of a slag tap *c*. The electrodes are of the same polarity, the opposing electrodes *d* being imbedded in the hearth of the furnace, in electrical contact with a conductive plate or bar *e*. The charge is introduced through the hopper *f*. The tap for the removal of non-volatile metals or matte, *g*, is shown at *h*. It will be noted that the electric current traverses the bath of slag, superheating it and rendering tapping easy.

The volatile reaction products pass through the outlet *j* and thence through a column *k* of coke or coal, contained in a chamber and heated by an electric current passing between the upper and lower ring electrodes *l*.



set in the walls of the reducing chamber. The chamber is connected electrically in series with the furnace. The charging aperture *m* for the coke or coal is normally closed by a cover set in a sand or other seal. The discharge gate for coke and ash is at *n*.

The zinc vapors, freed from carbon dioxide, aqueous vapor and other compounds capable of oxidizing zinc, pass from the reducing chambers to the condenser *o*, which is provided with air-cooled partitions *p* constructed to direct the vapors in a tortuous bath. The outlet for non-condensing gases is at *r* and the metal tap at *s*.

In the charge for the electric furnace is incorporated only such portion of carbon as is necessary for the reduction of the metallic constituents, producing an easily fusible slag which may be tapped off as desired. Any lead, copper or iron accumulates as metal or matte beneath the slag and is withdrawn at will, and fresh portions of the charge may be admitted continuously or at intervals, securing the advantages of continuous operation.

In having only carbon enough to effect the proper reduction, the Johnson furnace differs essentially from the retort furnace, where the residues containing 30 per cent or more of fixed carbon are drawn out as a dry or semi-fused powder.

#### Roasting, Preheating and Reduction

The ore may be considered as passing through three processes, namely: the roasting, the preheating, after it has been mixed with the fluxes and reducing agent, and finally, the reduction and smelting in the electric furnace. As an example, an ore may contain as its essential constituents zinc, iron and sulphur in the proportion of zinc 40 per cent, iron 20 per cent, and sulphur 30 per cent; it may contain also, in small proportion, sulphides of copper and lead and precious metal. This ore, after suitable crushing, is roasted at a temperature of from 850 to 900 deg. C. in a roaster of the muffle type. The zinc and iron sulphides are largely converted into oxides and at such a temperature as to be rendered much easier of reduction. In actual practice at Hartford the roasting is not complete, and a dead roast to 0.50 per cent S, the present practice in zinc works, is not desired. The sulphide ores are reduced down to 3 to 6 per cent sulphur, which results in the production of a gas rich in sulphur dioxide suitable for conversion into sulphuric acid as an important by-product.

The material next goes to the mixer, where carbon is added in the form of coal, together with fluxes so as to make a slag running 5 to 15 per cent iron, 25 to 30 per cent lime, and 40 to 45 per cent silica. In the preheater the mass is heated to 900 to 1000 C., a full red heat, and the charge is fed hot into the electric furnace.

The action of the furnace causes the lead to be reduced to bullion and collects the silver and gold at the bottom of the furnace, whence it is drawn off from below. The iron, copper and sulphur, combined to form a copper matte, float in a layer on top of the lead. The zinc passes to the condenser where it is turned into spelter. The last run of the furnaces produced 390 lb. of spelter at one tap, with 11 lb. of blue powder. This was from a roasted ore containing Zn 40 per cent, Pb 8 per cent, Cu 2 per cent, FeO 12 per cent, the remainder lime, silica, alumina and alkalis.

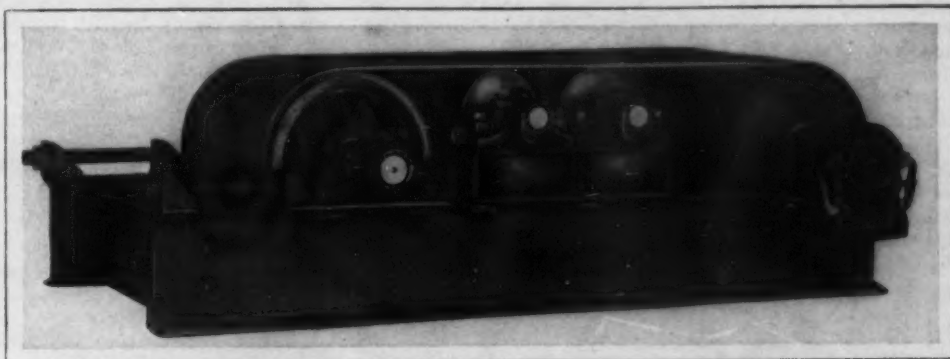
The unit on which Mr. Johnson has done his most successful work had a capacity equal to 40 retorts. A unit is now in course of erection which will have a capacity equal to 80 retorts. As the heat is put inside the furnace exactly where it is needed and where no air can get at it, instead of outside and indirectly, as in a retort furnace, there is every reason to believe that larger units will work better. At any rate this has been the experi-

ence in increasing the size of the unit in the past year.

The central idea in Mr. Johnson's mind has been to produce a unit of continuous action and capable of expansion to large units so that all the economies of labor-saving devices could be gained, a thing that is obviously impossible in the present practice with the 50 lb. retort.

#### Magnetic Coal Separator

In the cement industry as well as in many lines of manufacturing magnetic material frequently has to be separated from the non-magnetic. Recently the Cutler-Hammer Clutch Company, Milwaukee, Wis., has installed



A New Type of Heavy Duty Magnetic Separator for Use in Cleaning Coal Built by the Cutler-Hammer Clutch Company, Milwaukee, Wis.

a special type of magnetic separator at the plant of the Southwestern Portland Cement Company, El Paso, Texas, which will be used for taking out stray pieces of iron, steel, etc., from the coal which is used in the kilns. This separator is built along somewhat special lines, an I-beam frame and idler pulleys being used.

These idlers are mounted between the wooden tail pulley and the magnetic pulley at the right of the accompanying engraving and are needed to keep the belt level under the weight of the coal fed to the separator. As the belt passes over the pulleys the coal is thrown off to the front of the magnetic pulley and conveyed away while the magnetic material is entirely separated from the fuel and passes around the pulley and drops off as the belt leaves the lower side. The coils of the magnetic pulley are enclosed in brass jackets and the current required to energize them is fed through two carbon brushes resting upon slip rings on the extension of the pulley shaft.

#### Life Saving at Sea

The American Museum of Safety has just made public the fact that Judge Elbert H. Gary, on behalf of the United States Steel Corporation, has presented the museum with \$5000 toward obtaining a collection of the best devices for saving life at sea, as a permanent exhibit for demonstration and study, free to the public. On Thursday afternoon, May 9, a meeting is to be held under the auspices of the museum, to consider safeguarding life on shipboard, and working models, some actual size, are expected.

Early next month Dr. W. H. Tolman, director of the museum, with its safety inspector, will go abroad to attend the International Congress of Accident Prevention at Milan, and to study the best European methods for life saving at sea, and the prevention of injurious effects of occupational diseases.

The policy of the museum is now being guided by Arthur Williams, who has just assumed its presidency, succeeding Philip T. Dodge, who felt obliged to withdraw on account of ill health and absence from the country. President Williams announces another gift of \$5,000 from an "unknown friend" for research work in connection with industrial poisons. Dr. Charles A. Doremus is chairman of this section of the museum's activities. The public is not only invited to visit the museum, at 29 West Thirty-ninth street, New York, between 9 a. m. and 5 p. m. every day to study its collections, but in addition its jury on exhibits requests inventors and anyone else with practical ideas for life saving at sea to submit them at the museum.



# Complaints of Ore, Pig Iron and Coke Rates

Pittsburgh Steel Company, Southern Furnace Companies and Connellsville Coke Producers Appeal to the Commerce Commission

The whole fabric of iron and steel freight rates as it has been built up by the railroads in the past 25 years, and the part these rates have played in determining the competitive position of the various producing districts, are involved in the Pittsburgh Steel Company's complaint against existing ore freights from Lake Erie to the Pittsburgh district, which came up for hearing at Washington April 22. The Pittsburgh Steel Company makes the Pennsylvania, the Lake Shore & Michigan Southern and the Pittsburgh & Lake Erie railroads defendants, and the Erie, Nickel Plate and Baltimore & Ohio railroads were given leave by the commission to intervene. The ground of action is the same as that on which the complaint of Mahoning and Shenango Valley iron and steel manufacturers is based, namely, that the ore rate from Lake Erie ports to their furnaces is considerably higher per ton mile than is charged on ore to certain competing districts.

The particular rate complained of is that of 96 cents on iron ore from Ashtabula Harbor to the Pittsburgh district, a distance of 125 to 130 miles. The Pittsburgh Steel Company has plants at Monessen and Glassport, Pa., and is now building two blast furnaces at Monessen. There has been much agitation of a reduction in the ore rate to the Pittsburgh district, and United States Senator George T. Oliver, when he appeared before the Stanley Committee last December, contended that instead of 96 cents it should be not more than 50 cents. In connection with Senator Oliver's testimony attention was directed by members of the Stanley Committee to the alleged fact that the connecting railroads of the Carnegie Steel Company and the Jones & Laughlin Steel Company received 26 cents out of the 96-cent rate charged other blast furnace companies.

## Lower Than Pittsburgh Rates for Longer Hauls

In the opening statement made by counsel for the Pittsburgh Steel Company in the hearing at Washington, it was stated that of an average of 15,000,000 tons of ore a year shipped to the Pittsburgh district, about one-half comes from Conneaut, Ohio, over the Bessemer & Lake Erie Railroad, owned by the Steel Corporation. Of the remainder about one-half comes over other roads to plants of the Steel Corporation in the Pittsburgh district and the other half to plants of independent steel companies. Ore from Lake Erie ports is shipped to other districts, also, including Wheeling, W. Va.; Columbus, Ohio, and Jackson and Ironton, Ohio. Counsel further stated that there was discrimination in the rates on iron ore from Lake Erie to plants in the Pittsburgh and other districts, and that it would be shown that "the only motive for this violation of law is to benefit, at the expense of all other consumers of iron ore, one particular interest—the United States Steel Corporation." Citing specific examples of what were termed unfair differences in rates counsel said:

When this ore reaches the lower lake ports, the various railroads distributing it from those ports to consumers in the district mentioned determine by mutual agreement and combination what rate shall be made and maintained as to each district. They have thus put into effect for the same service for a longer distance, and under circumstances less favorable to the railroads, rates which directly discriminate against the Pittsburgh district. For example: The Pennsylvania Railroad hauls this ore from Lake Erie to Columbus, a distance of 138 miles, for 50 cents per ton, and charges the Pittsburgh district 96 cents for hauling this ore a distance of about 130 miles. The Pennsylvania Railroad hauls this ore from Lake Erie to Wheeling, a distance of 160 miles, for 60 cents per ton, and really gets but 40 cents net. And so the railroads in this combination haul iron ore from the lakes to Jackson, Ohio, a distance of 217 miles, for 62½ cents per ton, and to Josephine, Pa., a distance of 228 miles, for 85 cents per ton.

We propose to show that this discrimination is a plain violation of law and that under no circumstances can railroads serving the Pittsburgh district lawfully charge more than 40 cents per ton for hauling iron ore from Ashtabula harbor to the Pittsburgh district.

Coming to what plaintiff claims is the violation of the Interstate Commerce act involved in these varying ore rates, counsel cited Section 2, which provides that a common carrier shall not receive a greater or a less compensation from one shipper than from another for like service under substantially like conditions. Section 3 is also cited, providing that no undue advantage shall be given any shipper. It was claimed that both these sections were violated by the 96-cent rate to Pittsburgh and the lower rates to other districts for larger hauls.

## The Steel Corporation's Low Cost of Hauling Ore

It is charged that the actual cost to the Steel Corporation's railroad of transporting ore from Lake Erie to Pittsburgh is less than 26 cents a ton. The conclusion is drawn that the Steel Corporation has an advantage of 70 cents a ton over other shippers of ore in the Pittsburgh district, or \$1.40 on a ton of pig iron. It is then charged that because it has an ore railroad, the Steel Corporation can sell pig iron at \$13.50 Pittsburgh, at which there is no profit to independent producers, and yet the corporation can make \$4 a ton.

The railroads, it is charged, have made themselves arbiters between the various pig iron producing districts and have made rates which presumably equalized pig iron production costs. On this point counsel says:

But even if it be assumed that the railroads have the right to equalize the cost of producing pig iron, we will show that the conditions which made the equalization possible nine or ten years ago, when the theory was first invented, have long since passed away. Before the Steel Corporation acquired its own system of transportation, a system larger now than some of the greatest railroads in the country, and when all producers of iron ore were equally dependent upon the railroads for their raw materials, it was possible, though even then unlawful, for the railroads by discriminating rates to equalize the cost of production. We will show further that the railroads are utterly unable to equalize the cost of producing pig iron even outside the Pittsburgh district and between that and other districts. It takes approximately two tons of iron ore, one ton of coke and one-half ton of limestone to produce a ton of pig iron. The railroads have so adjusted the cost of assembling these raw materials at the Pittsburgh furnaces that the total is \$2.75 for every ton of pig iron. In Birmingham, where the district is controlled by the Tennessee Coal, Iron & Railroad Company, which belongs to the United States Steel Corporation, the total cost of assembling these raw materials is 52½ cents.

## Statements by Plaintiffs

The statement of Wallace Rowe, president of the Pittsburgh Steel Company, took up the question of the equalization of pig iron costs in various districts through railroad rate fixing. He cited the testimony before the Stanley Committee to the effect that the railroads had for a number of years made their rates on iron ore, coke and limestone so as to produce an equality of pig iron cost between the furnaces of the Pittsburgh district and those of the Mahoning and Shenango valleys, Wheeling and Columbus. This, he alleged, explained a rate of 75 mills per ton mile in the case of the Pittsburgh district and about half as much to certain other districts. While it might be expected that this policy would carry with it an equalization of rates on finished products to markets, this was not the case, for Pittsburgh's competitors to the West all have an advantage in such rates to all markets west, south and north.

Mr. Rowe charged that under present conditions there are five rates on iron ore in the Pittsburgh district: the cost of 26 cents to the Steel Corporation to most of its furnaces; the rate to other Steel Corporation furnaces, which is less than 96 cents because of a terminal allowance; the net rate of 86 cents to the Jones & Laughlin Steel Company through an allowance of 10 cents to the Monongahela Connecting Railway; the rate of 78 cents to the Aliquippa furnaces of the last named company; finally, the regular rate of 96 cents.

Traffic Manager Kennedy of the Pittsburgh Steel Company testified that the cost to the Steel Corporation of hauling ore over the Bessemer & Lake Erie Railroad to Pittsburgh was 26 cents. He was asked for the source of his information but refused to give it, saying that his informant would be discharged if his identity were known. The commission decided that the name need not be given.

Southern Furnace Companies Complain of the Pig Iron Rate

The case of the producers of pig iron in the South has at last come before the Interstate Commerce Commission. As reported in these columns some months ago, most of the Alabama and Tennessee furnace companies united in a request that the railroads reduce their rates on pig iron to a point north of the Ohio River, which for several years have been based on \$3.25 from Birmingham to Cincinnati. The request was refused by the railroads and the matter has now been carried to Washington, the complaint being filed by the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala.; the Woodward Iron Company, Woodward, Ala., and others. The railroads cited are the Louisville & Nashville, Illinois Central, Alabama Great Southern, Seaboard Air Line, Atlanta, Birmingham & Atlantic and Mobile & Ohio. It is alleged that the pig iron rates from Tennessee and Alabama to Ohio and Mississippi River points and beyond and to Eastern and New England points are unjust and discriminatory. The decline in pig iron from a basis above \$20, Birmingham, which existed when the \$3.25 rate to Cincinnati was last fixed, is cited in the petition and it is argued that while pig iron went down to \$10, Birmingham, no change was made in the freight rate. The petitioners aver that some of the railroads would be willing to reduce rates now if they could be assured of permission to advance them later when conditions in the pig iron industry have improved.

Higher Rates on Foundry Coke Attacked

The Coke Producers' Association of the Connellsville district in Pennsylvania have filed a complaint with the Interstate Commerce Commission against the Baltimore & Ohio, Pennsylvania, Lake Shore, Erie, and other railroads, alleging an unreasonable and unjust rate on shipments to districts west of Connellsville consisting of foundry and other cokes, apart from furnace coke. The petition says that what are known as "furnace rates" apply on shipments of blast furnace coke. The rates on foundry coke are higher, the excess on the latter being, for example, 40c. to Toledo, 25c. to Detroit, and 20c. to certain Wisconsin points. The rates cited are alleged to be unjustly discriminatory when compared with those for similar service on other lines serving competitive fields. The commission is asked for an order directing the railroads to cease charging these rates.

Health problems in modern industries are to be discussed on Tuesday afternoon, June 4, at the Hotel Marlborough, Atlantic City, N. J., in connection with the second national conference on industrial diseases held jointly by the American Association for Labor Legislation and the American Medical Association. Papers are announced on the "Temperature and Humidity in Factories," by Royce W. Gilbert, sanitary engineer, Boston; "Air Impurities—Dust, Fumes and Gases," by Charles Baskerville, College of the City of New York; "Effects of Air Conditions Upon Health of Workers," by Dr. George M. Price, medical director Factory Investigating Commission of New York State; "Psychological Factors in Human Efficiency," by Prof. Hugo Munsterberg, Harvard University. Other sessions are to take up industrial diseases, Tuesday morning, June 4; the state promotion of industrial hygiene, Tuesday evening, June 4, and industrial diseases, Wednesday morning, June 5.

W. J. Fogarty, warden of the Indiana state prison at Michigan City, will ask the Legislature at its next session to double the capacity of the prison binder twine plant. Orders have been received from farmers for the full output of the plant this year, 3,000,000 lb.

Pig Iron Cost in the 'Sixties

An Ohio Furnace Record Showing a Loss of \$6.75 a Ton

Occasional bits of information on the iron trade of 40 and 50 years ago give blast furnacemen an appreciation of the financial strain under which their predecessors struggled. Incidentally they refresh the memory of some longest in the industry on the tremendous contrasts in output between those days and the present. The exhibits below, which are in the possession of D. B. Meacham of Rogers, Brown & Co., Cincinnati, are from the records of a Northern Ohio blast furnace and belong to the old days of the use of bituminous coal in a good many of the blast furnaces of the Central West, the days also of the "open top" furnace.

It will be noticed that the loss on every ton of pig iron sold in the period referred to was \$6.75.

Copy.

The furnace was blown in on the 14th of August, A.D., 1865, and continued in blast until the 5th of September, 1866. Hence she was run 1 year and 22 days and has made in all 4496½ tons iron, as appears more plainly by statement No. 2:

|                                       |      |           |      |
|---------------------------------------|------|-----------|------|
| The total sales amount in all to..... | 3803 | 1588/2240 | tons |
| There remain on hand—                 |      |           |      |
| At Pittsburgh.....                    | 30   | tons      |      |
| " Detroit .....                       | 25   | 950/2240  | tons |
| " Chicago .....                       | 520  | 1830/2240 | tons |
| " Milwaukee .....                     | 55   | 170/2240  | tons |
| " Toledo .....                        | 18   | 1600/2240 | tons |
|                                       | 650  | 70/2240   | tons |
|                                       | 4453 | 1658/2240 | tons |

which shows shortage in weight of 42 1744/2240 tons on total of 4496½ tons, or about 1 per cent for sand.

The actual cost of material used in the manufacturing, as well as labor, expenses of tools, and incidental expenses, interest, etc., will appear by statement No. 3, to which is added the price at which the iron sold. It will likewise show our production of five weeks average of whole blast, compared with the last five weeks we were in blast, and difference in cost of iron as specified on paper 4.

|  |         |
|--|---------|
| Cost of Material and Manufacturing                             |         |
| It took per ton of iron 4 803/2000 tons of coal at \$5.30..... | \$23.35 |
| 2 820/2000 tons of ore at \$4.40.....                          | 10.45   |
| 1 822/2000 tons of limestone at \$1.68..                       | 2.35    |
| All material 8 205/2000 tons cost .....                        | \$36.15 |
| The average cost per ton....                                   | \$4.41  |
| Cost of manufacturing:   |         |
| Labor .....  | \$6.70  |
| Cost of tools, revenue tax, etc.....                           | 4.00    |
| Repairs per ton of iron.....                                   | 2.75    |
| Interest, fire insurance, county tax.....                      | 1.50    |
|  | 14.95   |
|  | \$51.10 |

|   |              |
|---|--------------|
| The total sales of iron with what remains on hand show—   |              |
| Total proceeds of.....  | \$199,365.87 |
| Or, per ton .....   | \$44.35      |
| Loss, per ton.....  | \$6.75       |
| Taking five weeks average of entire blast shows a production of 409 tons of iron, costing, per ton..... | \$46.85      |
| Five weeks, the last we ran, show production of 539 tons costing, per ton.....                          | 37.98        |
| Or difference in cost of iron, per ton.....   | \$8.87       |

In the "good old times" the cost of the items apart from raw materials, it will be noticed, was more than the average selling price of pig iron in Ohio districts in the past three years. The high fuel cost is noteworthy—\$23.35, or nearly half the total cost of pig iron.

An International Congress for the Prevention of Accidents is to be held in Milan, Italy, May 27 to 31. French, Belgian and Italian associations for accident prevention in industrial establishments acting in conjunction with a permanent Committee for Social Insurance plan to hold a number of meetings dealing with the prevention of accidents and with industrial hygienic measures. Francesco Massarelli, Foro Bonaparte, 61, Milan, is general secretary.

S. D. ECHER  
Mechanical and Civil Engineers,  
PITTSBURGH, PA.



## Forge Cold Sawing Machine

### Details of a Machine Tool for Heavy Work Recently Developed by the Newton Machine Tool Works, Inc.

Low ultimate cost has been given consideration by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., in the design of its new

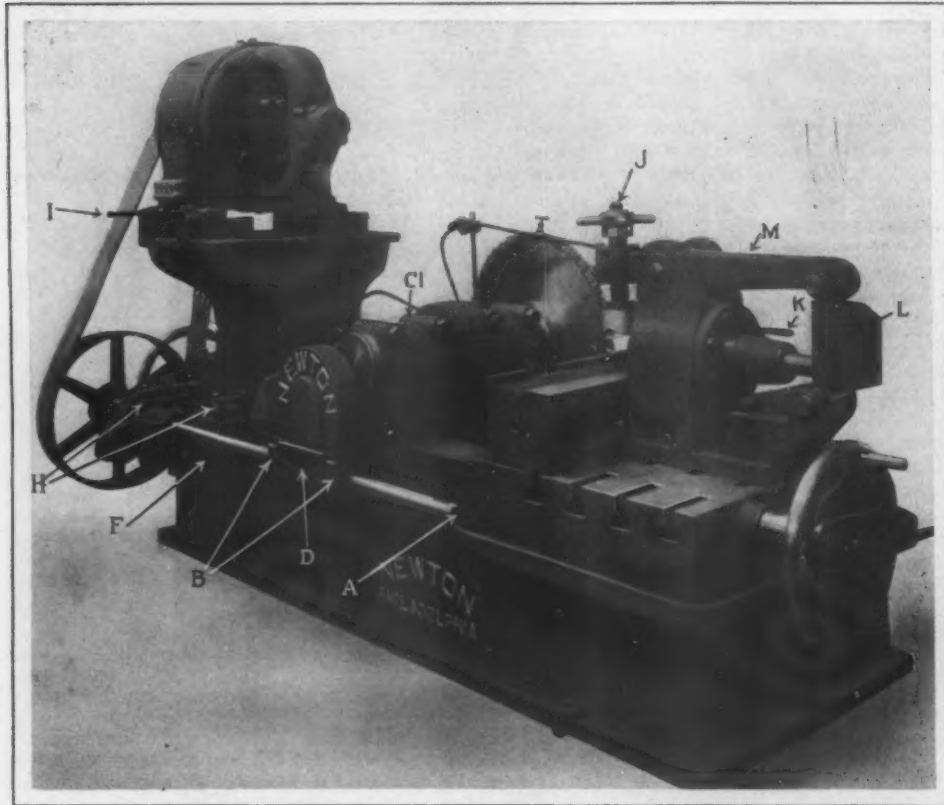


Fig. 1—Front View of a New Forge Cold Saw Cutting-off Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

cold metal saw for forge and similar heavy work. It is emphasized that the first cost, repairs, saw replacements, power consumption, operating cost, productive cost, etc., are low and that the machine will operate satisfactorily at modern productive rates and the accompanying heavy overloads without the destruction of alignment and fit of parts. This machine is of the 32-in. blade size and is intended to operate on stock up to 8 in. in diameter, although the capacity enables stock  $9\frac{1}{2}$  in. in diameter to be handled and in several instances where the machine is equipped with a 26-in. blade for cutting 5-in. round stock, increased feeds have been made possible. Fig. 1 is a front view of the machine and the details of the different adjustments are shown in Fig. 2.

These machines have alloy steel spindles and driving and feed gears. The spindles are finished by grinding and revolve in capped bearings which in common with all the others have bronzed bushings. To protect the bearing and prevent the escape of oil the spline shaft A,

Fig. 1, is fitted with auxiliary bushings in the bearings on each side of the driving worm at D. The base and the table are integral with the pan and reservoir for the oil which are cast solid and the base, like the saddle, is of extra heavy section. The saddle has interlocking gibs cast solid on the operating side C, Fig. 2, and all the adjustments are made by taper shoes. All opposed stresses have a bearing in a common casting. The spindle gear and the driving pinion have a bearing at C, Fig. 1, and the worm and worm wheel connection at D. Another point is at E, Fig. 2,

where motion for the feed is taken from the driving spline shaft at F, Fig. 1. Six changes of feed are available and the different combinations are controlled by the lever N.

The machine is driven by a Westinghouse type S 20-hp. motor running at a speed of from 400 to 1200 r.p.m. The bracket supporting this motor has been made high to give a long belt and the connection from the motor to the driving shaft is by a double 6-in. belt. Set screws fitted to the motor bracket at I provide a means for tightening the belt. The hand adjustments, the control of the feeds and the fast power traverse are available both at the front and the back of the machine.

After the machines were developed to the point where the maximum output of the saw blade was obtained it was found that it was possible to save time in setting and clamping the work. A power clamp was therefore developed which required only hand adjustment of the screw J until the V piece touches the work to be cut and the movement of the lever K, Fig. 2, attached to



Fig. 2—View Showing Details of Adjustments

the valve admits air to the cylinder. This pushes the double angle block L, Fig. 1, which is attached to the piston forward and forces the arm M to move in a vertical line, thus giving



ing a downward pressure to the clamp of approximately 16,000 lb. This air clamping mechanism is a separate attachment and if desired can be furnished for any of the company's standard machines. The V block is also a separate casting and can be easily removed, thus enabling I-beams and similar structural material to be cut if desired. The floor space occupied by the machine is approximately 9 by 4 ft.

In tests made of the machine 6-in. round bars have been cut in 1 min. and 15-in. I-beams have been sawed in a vertical position in 2 min., actual cutting time.

## The Economy 16-in. Lathe

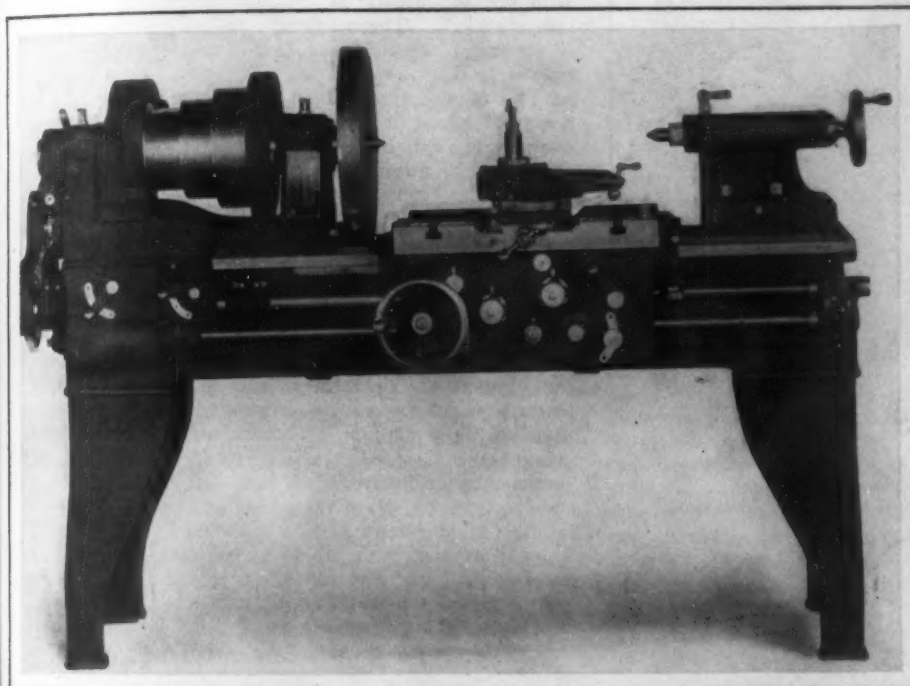
The Rockford Lathe & Drill Company, Rockford, Ill., has recently brought out a 16-in. double back geared engine lathe which is a rigid and powerful tool. The design, it is emphasized, conforms strictly to the demands and conditions of modern shop practice and the standard of workmanship and design is high, and as its special fea-

sliding steel gears and hardened steel clutches and in this way a practically unlimited range of feed for all classes of work as well as a powerful drive is obtained.

The following table gives the principal dimensions and specifications of the lathe:

|  |        |
|--|--------|
| Swing over ways, in.....                     | 18½    |
| Swing over carriage, in.....                 | 11¾    |
| Distance between centers, 6-ft. bed, in..... | 28     |
| Diameter of hole in spindle, in.....         | 1½     |
| Minimum number of threads cut per inch.....  | 2      |
| Maximum number of threads cut per inch.....  | 96     |
| Size of tools, in.....                       | ¾ x 1¼ |
| Net weight, 6-ft. bed, lb.....               | 2,150  |
| Shipping weight, lb.....                     | 2,300  |

The regular equipment of the lathe includes steady and follow rests, large and small face plates, a full set of change gears and wrenches and a countershaft. If desired the lathe can be furnished with either an 8 or a 10-ft. bed which will increase the weight approximately 275 lb. for each additional 2 ft. Other attachments which can be furnished at a slight extra cost include draw-in attachment and collets, taper attachment, a turret on the carriage and a turret on the shears with or without power feed.



The Economy 16-in. Lathe Built by the Rockford Lathe & Drill Company, Rockford, Ill.

tures are applicable to a wide range of work it is a convenient and practical tool.

Massive construction characterizes the headstock, which is bolted to the bed. The high carbon steel spindle is finished by grinding and has a 1½-in. hole extending the entire length which enables draw-in collets having a maximum capacity of ¾ in. to be used. The tailstock is of the off-set type and enables the compound rest to be set parallel to the bed. The turning of tapers is also possible as it has a set over. Double clamping bolts hold the tailstock in position without slipping.

The bed is of deep section and is reinforced with wide cross braces. These together with the manner of distributing the metal, it is emphasized eliminate all vibration under the heavy duty for which this lathe is especially designed. The carriage is of heavy construction with an extra wide bridge that enables a heavy cut to be taken without chatter. It has a bearing of 26¼ in. on the ways and has self-oiling felt wipers. A thread-cutting indicator which can be disengaged when not in use can be employed for cutting long threads. The apron is of heavy design with a double bearing for all shafts. The gears, which are of steel, have wide faces and the teeth, which are of coarse pitch, are machine cut. All the feeds are reversed in the apron and interlock with the feed screw nut, thus making it impossible to engage the feed and the lead screw at the same time. The gear box enables all pitches of thread to be cut without compounding of gears. Three quick-feed changes are obtained for each change of gearing through

Rolph, Mills & Co., commission merchants, Western Metropolis Bank Building, San Francisco, Cal., furnish information regarding importations of foreign materials at San Francisco since January 1. The pig iron importations comprised 2075 tons, of which 1575 tons came from England (East Coast) and 500 tons from China (Chung Wang Tai). The importations of coke in the same period comprised 4897 tons, of which 2536 tons came from England, 1272 from Germany, 1047 from Australia and 42 from China. It is stated that in the quarter preceding January importations were very much heavier. Considerable coal is also imported at San Francisco for the use of blacksmiths.

## The Pelton Water Wheel Company

Edward L. Brayton, president of the Pelton Water Wheel Company, San Francisco, returned to the Pacific coast April 27, after a few days in the East during which he conferred with J. V. Kunze, vice-president of the company, and visited the new shop at Harrisburg, Pa. Mr. Brayton states that the company has contracts which will keep it busy to full capacity for months. The San Francisco plant is now working 16 hours a day and will be in operation continuously day and night by July.

The company has well under way the Los Angeles aqueduct power plant which will take water from the Owens River, and which is to be utilized primarily for municipal purposes. The plant will consist of three water wheel units of 14,000 hp maximum capacity each, operating under a 875 ft. head and direct connected to Westinghouse generators of overhead construction. The installation is of the Pelton-Doble type with oil pressure governors. Another big project which the company has begun is an installation in northern California for the California-Oregon Company, recently incorporated. Two Pelton-Francis turbines of 18,500 hp. each, direct connected to General Electric generators, are to be installed. They will operate under a head of approximately 130 ft. The construction of a large dam near Thrall, Cal., is a part of this enterprise.

The name of the Carnegie Technical Schools at Pittsburgh has been changed to Carnegie Institute of Technology.

## A New Direct-Connected Elevator Machine

An improved type direct-connected electric elevator winding machine has recently been developed by J. G. Speidel, Reading, Pa. It is particularly adaptable for service in factories, warehouses and stores where alternating current alone is available and where moderate car speeds are sufficient to meet the demand. Induction motors are



A New Direct-Connected Moderate Speed Elevator Winding Machine for Use with Alternating-Current Motors Built by J. G. Speidel, Reading, Pa.

being more and more extensively used for driving elevators and, while admirably adapted for some classes of service, possess, it is found, certain definite limitations which must be taken into consideration. Low speed and comparatively good efficiency, the maker states, are hard to obtain, resulting in a restriction to direct-connected machines of the higher speed ranges, or to the use of belts.

To overcome this the maker of these machines has constructed a new type machine, illustrated herewith. It consists of the standard Speidel worm geared type of winding machine mechanism, with a two or three phase reversible induction motor, mounted together on a heavy cast-iron bed plate, making a solid arrangement calculated to prevent the winding mechanism and the motor from getting out of line. The motor is connected to the shaft of the winding machine by a fibre pinion and grey-iron spur gear. The latter is cut from the solid and the arrangement gives a speed reduction of two to one, to allow the adoption of commercial speed ratings of alternating-current motors with high efficiency for a moderate car speed and still maintaining the substantial features of the direct-connected winding machine.

The machine is operated by a quick-acting drum reversing switch, thus eliminating sparking and cutting off the current entirely when the machine is stopped and giving perfect control and safety. For the larger sizes of machines a controller is used to keep the inrush of current down to the minimum when the machine is started. The worm gearing is of the Hindley type, with a curved worm. This gives good efficiency and by assuring at least four teeth of the worm being in mesh with the gear at all times, provides a large factor of safety. The worms and the gears are machine cut from solid blanks and are inclosed in an oil tight and dustproof cast-iron housing. The end thrust bearings of the worm shaft are equipped with ball thrust bearings to minimize friction and wear. An automatic travel limiting device and a slack cable stopping device are provided.

The machines are built both for floor or ceiling mounting and are self-contained, all parts being fastened to the bed plate. A similar type machine is manufactured by the firm for use with single-phase current. It is equipped with an electrical device which makes it impossible to reverse the direction of the motor before it has come to a stand-

still. It is emphasized that with this device the control is positive, as the stopping of the motor through switches automatically controls the direction in which it operates.

These machines, with single or polyphase motors, are made in a number of sizes for handling loads ranging from 1000 to 6000 lb. For direct-current service the Speidel winding machines are built without the intermediate spur gearing, the motor shaft being directly connected with the worm shaft by a flanged coupling. Owing to the wide speed range of direct-current motors, it is possible, it is explained, to secure a car speed as low as 40 ft. per minute with this system.

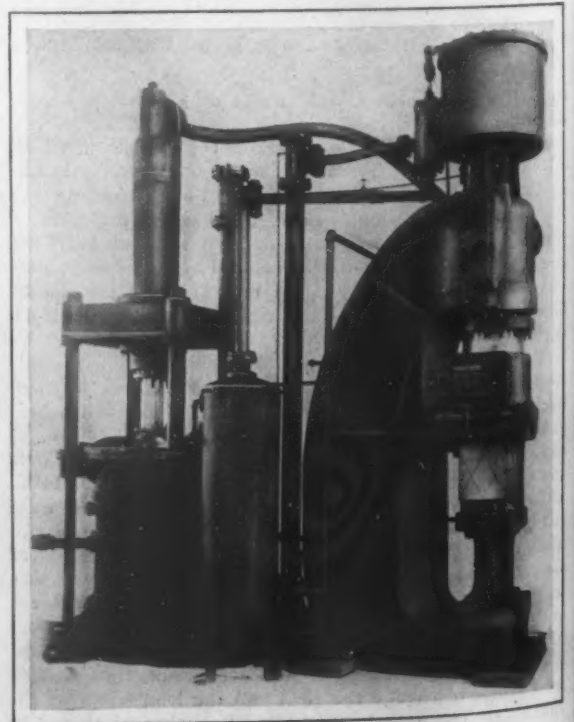
## Chambersburg Steam Hydraulic Presses

A line of steam hydraulic presses in both the single frame and four-column types has been developed by the Chambersburg Engineering Company, Chambersburg, Pa. The distinguishing features of these presses are a direct application of power and a double lever control, together with the availability of different pressures in the larger size machines. The maximum pressure developed by the single frame press is 400 tons and that of the four-column type is 5000 tons.

The advantages claimed for the double lever control are greater ease in operation and simplicity in design. The operator has entire control of the press by two hand levers, and since their functions are the same as those which the operator has been accustomed to secure with the two levers of a steam hammer, the operation of the press is thus easily mastered. The length of stroke of the ram is adjusted with one lever and the power stroke is secured by the manipulation of the throttle, the ram in both cases following the direction in which the lever is moved.

A triple intensifier employed in connection with the larger sizes of press effects an economy in the steam consumption as the operator is able to select a pressure in proportion to the varying necessities of the work, and thus only the amount of steam required for the work being forged is used. It is emphasized that ordinarily a single cylinder intensifier is used which consumes a constant volume of steam regardless of the pressure exerted. In the Chambersburg press a machine having a maximum capacity of 2000 tons would be arranged for three pressures of 600, 1200 and 2000 tons with the steam consumption in proportion to the pressure exerted.

The main frame of the single column press, shown in the accompanying engraving, which will develop a maxi-



One of the Line of Steam Hydraulic Presses Built by the Chambersburg Engineering Company, Chambersburg, Pa.



mum pressure of 400 tons is an open-hearth steel casting of I-beam section, the web being stiffened by heavy reinforcing ribs. The frame has heavy guides for the ram and is fitted with a cap that is rigidly bolted on the front of the press to take care of strains in any direction when forging beveled work. Additional support for the press is afforded by projecting flanges at the base of the frame. In use the dies are skewed so that the work will clear the frames when either drawing or finishing operations are being performed. If it is planned to use a set of the dies already purchased the notches in the ram and the die seat can be planed to suit the dovetails on the dies.

### A Large Three-way Facing Machine

For facing the flanges of large pipe fittings, valve bodies, etc., the Pottstown Machine Company, Pottstown, Pa., has built a 25-in. three-way facing machine or swiper. It is equipped with three 25-in. facing heads, each having 22 high speed steel cutters. Fig. 1 is a front view of the machine and an end view showing the geared drive is given in Fig. 2.

Each head is fed up to the work by an air cylinder and the feed is controlled with an oil cylinder on the same piston rod. Each of the spindles, which are 8 in. in diameter and driven by a spur gear 51 in. in diameter and  $7\frac{1}{2}$  in. across the face, is mounted on a head that can be shifted on the bed by a rack and pinion. These heads are fastened to the bed by six  $\frac{1}{2}$ -in. bolts and a further provision against thrust is given by a jack screw bearing against the end of the bed. The spindles are mounted on a supplemental slide and have a movement of  $1\frac{1}{2}$  in. representing the amount of movement necessary to remove the scale from the rough casting and finish it to size. The maximum distance between the front cutter heads is 45 in. or 23 in. from the center of the fitting. The two heads will face up to a maximum distance of  $9\frac{1}{2}$  in. The height from the table to the center of the spindle is  $16\frac{1}{2}$  in.

The table, which has a sliding and revolving top operated by air, gives sufficient room for two sets of fitting holders so that while one end is being faced the other end is being loaded. The work is held in position by a massive steel yoke over the top of the machine equipped with a lever and pneumatic cylinder which is capable of exerting a pressure of 50 tons on the fitting. The differ-



Fig. 2—An End View Showing the Geared Drive

that is being applied to the fitting and thus prevents the cutter from being brought up to the work before it is firmly clamped.

The machine is driven by a 25-hp. motor with a gear ratio of 256 to 1 as is clearly shown in Fig. 2. The total floor space required by the machine is 208 by 197 in. and the height above the floor line is 8 ft. The weight of the machine is approximately 60,000 lb.

### The Trumbull Steel Company

The Trumbull Steel Company, Warren, Ohio, has been organized to erect a tin plate mill in that city, and has been incorporated with a capital stock of \$1,000,000. The officers will be: President, Jonathan Warner, Youngstown; vice-president, W. T. Hardesty, Niles; treasurer, W. H. B. Ward, Niles; office manager, Warren Kerr. Work on the erection of a plant will be started as soon as possible. It is stated that the plant will have a capacity of 35,000 tons annually. It will be erected on a 57-acre site, comprising the bulk of what is known as the Younger farm on the river road between Warren and Niles. It is planned to make it the largest tin plate mill in the Mahoning Valley.

The plant as planned for the start will consist of six tin plate mills. A power plant will be provided with sufficient capacity to take care of double that number of mills, it being the intention to later increase or, perhaps, double the size of the plant. Mr. Warner, who is at the head of the company, formerly controlled and was president of the Empire Iron & Steel Company,

Niles, Ohio, now owned by the Brier Hill Steel Company. W. H. B. Ward and W. T. Hardesty were associated with Mr. Warner in the management of the Empire mills.

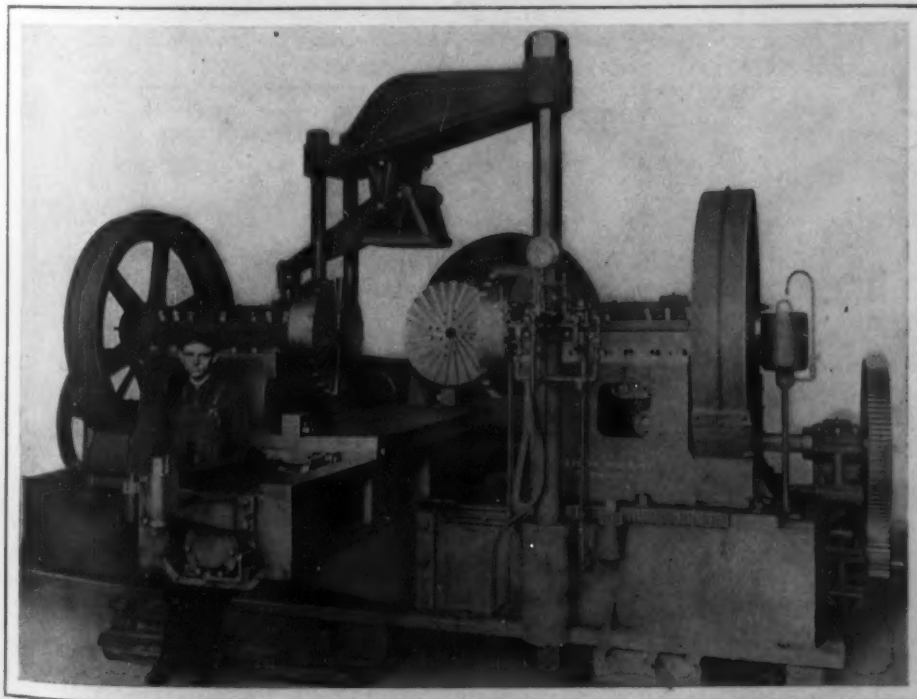


Fig. 1—Front View of the 25-In. Three-way Facing Machine Built by the Pottstown Machine Company Pottstown, Pa.

ent operations on the machine are accomplished by three air valves located on a stand attached to the column on the side of the machine. A gauge shows the pressure



# An Unusual Coal and Ash Handling Plant

## Man-Carrying Trolley Hoist Commanding Coal Yard and Boiler Hoppers of the Steam Plant of the Bryant Paper Company, Kalamazoo, Mich.

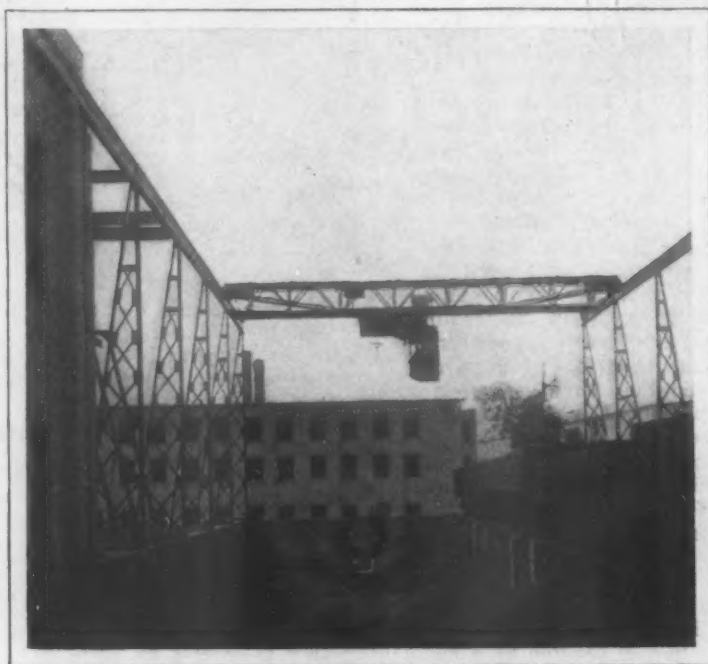
The Bryant Paper Company, Kalamazoo, Mich., has installed at its plant for generating steam ten 300-hp Wickes steel-encased vertical boilers, arranged in two batteries of five boilers each and equipped with Detroit reciprocating feed stokers furnished by the Detroit Stoker Company. The installation for handling the coal and ash embodies several interesting features which have a bearing both on the operation of the plant and on the maintenance of the equipment.

Immediately outside of the boiler house and paralleling it a concrete coal storage pit, 60 ft. wide and 200 ft. long, has been built. As illustrated in an accompanying cut, coal may be brought to this storage on a trestle extending along one side. Spanning the pit and traversing its entire length is a three-motor electric traveling crane. The bridge of this train carries a heavy I-beam monorail from which is hung a monorail trolley hoist with operator's cab and grab bucket. Coal can thus be received either in ordinary

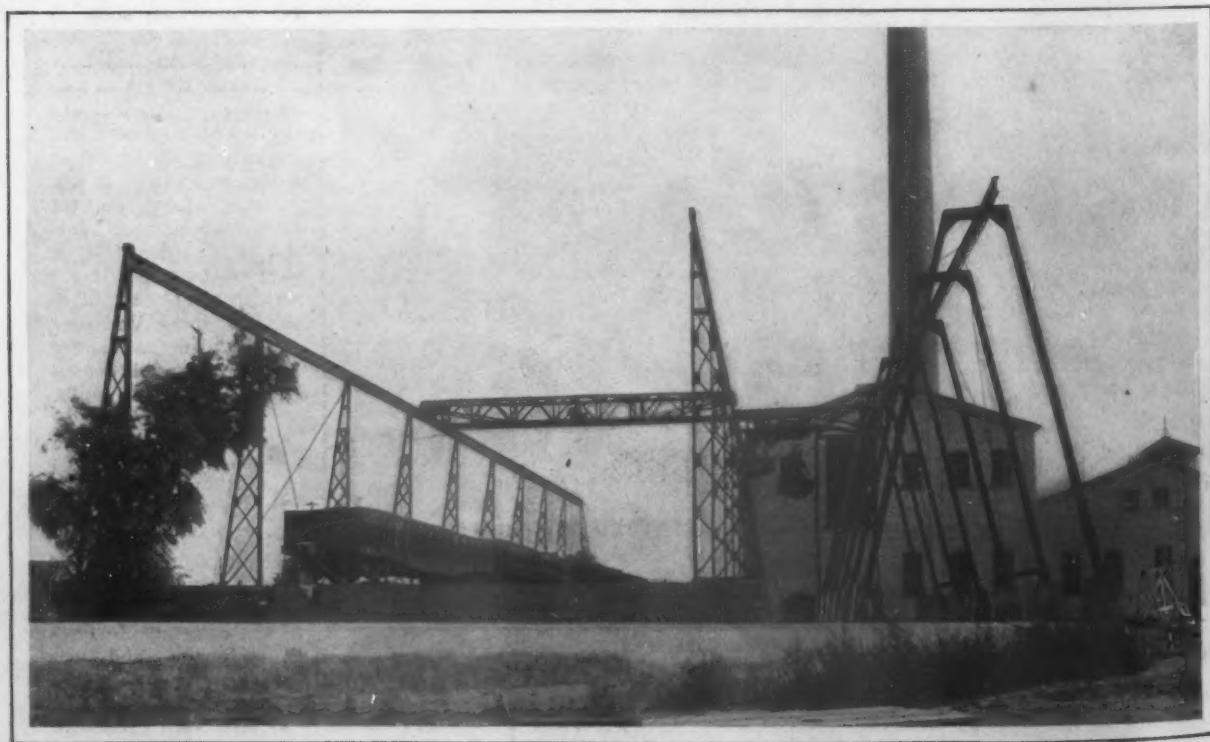
or bottom dump cars, being distributed over the pit by the bucket as may be necessary. The pit is made water tight with the necessary connections for flooding and draining and thus eliminating fire dangers.

A fixed monorail is suspended in the boiler house traversing the entire front of the two batteries at a suitable height and curving outside of the building in such a manner as to make possible a continuous connection with the monorail of the coal pit crane when that crane is properly spotted on the crane runway. This is illustrated in the lower illustration. It is thus apparent that the coal may be carried by means of the monorail trolley and bucket from the storage pit crane into the boiler house where the coal may be dumped either into the boiler hoppers or into the hopper of a traveling motor-driven crusher.

The installation of this crusher makes it possible to use either slack or run of mine coal as market conditions may warrant. The speeds of crane and trolley travel are such



View of Coal Store and Traveling Crane Commanding It



Traveling Crane and Monorail, Showing How the Operator's Cab and Coal Bucket May Enter Boiler Room

as to afford a carrying capacity from storage to boilers of about 30 tons of coal per hour. At this rate sufficient coal can be supplied in 4 to 5 hours, the remainder of the time being used for storing coal or removing ashes. The ashes handled from the boiler house by the bucket may either be run out on the straightaway trolley shown in one of the illustrations and dumped on a waste heap or deposited in cars for shipment.

The equipment of the trolley is somewhat unique as regards the small number of mechanical parts. The number of gears used is very limited and instead of a mechanical brake a dynamic braking controller of the type manufactured by the Electric Controller & Mfg. Company, Cleveland, is employed. The installation is elastic in its operation, requiring one man in the cab of the trolley and one common laborer. All of the storing, distributing and removal of coal and ashes for this plant of ten boilers, operating 24 hr. per day, is accomplished and in addition the cab operator and common laborer are employed for a part of the day trimming coal in the cars and operating the bottom dump cars. The handling plant was built by the Northern Engineering Works, Detroit, after plans prepared by D. J. Albertson, consulting engineer, Kalamazoo, Mich.

### The Production of Copper in 1911

The United States Geological Survey has published its statistics covering the production of copper in the United States in 1911. It gives the total production of new refined copper in that year as 1,433,875,926 lb. This was the largest production in the history of the industry, exceeding that of 1910 by 11,835,893 lb. These figures differ slightly from those published in January by the Copper Producers' Association, which were 1,431,398,336 lb.

The figures above given cover the production from primary sources, divided as follows: Electrolytic, 823,507,764 domestic and 332,604,223 foreign; Lake, 218,185,236; casting, 22,977,534; pig, 36,600,269. The secondary production comprised 19,093,622 lb. electrolytic and 8,803,105 lb. casting, making a total of 27,896,727 lb. Including the production from secondary sources, the total output in 1911 was 1,461,771,753 lb., against 1,453,080,009 lb. in 1910.

In addition to the secondary material treated by the regular refining companies, plants that treated secondary material exclusively produced a total of 186,311,000 lb. of copper as copper and in brass and other alloys of copper, making a total production of 214,207,727 lb. from secondary sources. Of this total at least 62,000,000 lb.

was obtained by remelting clean scrap produced in the process of manufacture of copper and brass articles.

If the output of plants treating purely secondary material is added to the production of the regular refining companies the contribution of the United States to the world's supply of copper for 1911 is found to be 1,648,082,753 lb.

The most important copper producing States, including the territory of Alaska, ranked as follows in output in 1911: Arizona, Montana, Michigan, Utah, Nevada, California, Alaska, Tennessee, Colorado, Idaho and New Mexico.

### Lower Iron and Steel Institute Dues

The directors of the American Iron and Steel Institute held a meeting at the offices of the Institute, 30 Church street, New York, on Friday, April 26. The principal action taken was the adoption of an amendment to the by-laws reducing the membership fee from \$50 to \$5 and the annual dues from \$50 to \$10. It is expected that the efforts that will now be put forth will result in a very considerable increase in the membership. The by-laws provide that "all persons over the age of 21 years, of high character and good standing, and engaged directly or indirectly in the iron or steel trade shall be eligible to membership."

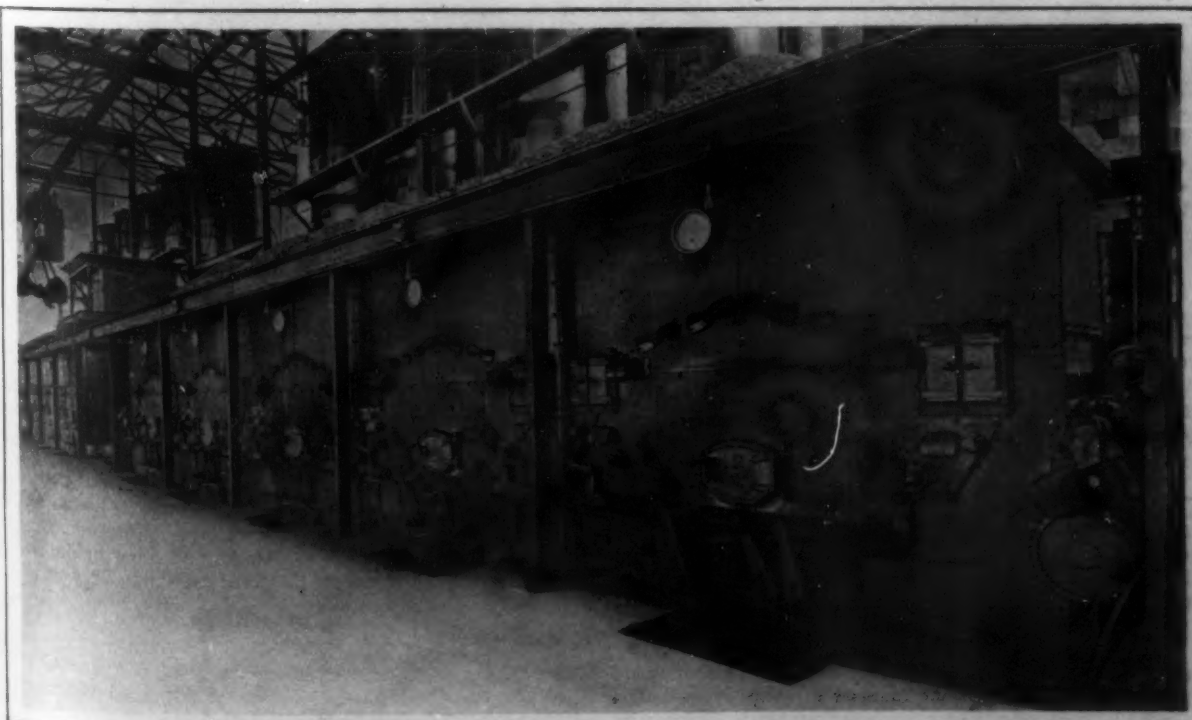
The programme for the annual meeting, which will be held May 17, with a dinner in the evening and for the excursions in and about New York City on the day following will be sent to the membership in the coming week.

### Analysis of Venezuelan Ore

The following is Andrew S. McCreath & Son's analysis of a cargo of Imataca iron ore unloaded a few weeks ago at Philadelphia for use at several Eastern furnaces. The moisture content was 0.208 per cent. Dried at 212 deg. the ore showed:

|                     | Per cent. |
|---------------------|-----------|
| Metallic iron ..... | 68.200    |
| Phosphorus .....    | 0.016     |
| Sulphur .....       | 0.042     |
| Silica .....        | 1.400     |
| Titanic acid .....  | 0.231     |
| (Titanium) .....    | 0.139     |

The selling agents are Naylor & Co., New York, and the property is operated by the Canadian Venezuelan Ore Company, Ltd., Montreal, Can.



The Boiler Plant, Showing Traveling Coal Crusher and Monorail Carrying Coal Bucket and Operator's Cab



## Data on Electric Iron Smelting

### Further Facts and Figures on Experience at Trollhättan, Sweden

Some interesting facts and figures regarding electrical iron smelting were brought out in a paper by Prof. Joseph W. Richards, Lehigh University, before the Engineers' Society of Western Pennsylvania at its February meeting. The author dwelt particularly on the plant at Trollhättan, Sweden, which plant was discussed at some length in *The Iron Age*, October 12, 1911. He emphasized that the pig iron produced has been equal in all respects to Swedish charcoal pig iron and some steel makers have regarded it better, attributing this to the fact that it does not appear to contain any oxides or nitrogen. It certainly does not contain the oxides which are frequently present in pig iron.

By cutting down the amount of carbon used for reducing, the furnace worked better, Prof. Richards said, consumed less power and less carbon, worked more rapidly, and produced a pig iron that was white instead of gray. By reducing the amount of fuel, and running at a lower temperature, a product was obtained with 0.1 per cent. silicon, 0.1 per cent. manganese, and as low as 1.5 per cent. of carbon. He did not believe in calling it pig iron but pig steel, because in composition it is simply steel. It is a metal with 2.2 per cent. or less of carbon, a very small amount of silicon and manganese, low in sulphur and phosphorus, made directly from iron ore in the electric pig iron furnace. "It is really crude steel, so we have called it pig steel, a name which has been generally accepted. Its German equivalent is 'Rohstahl' and in French 'Acier brut.'"

Prof. Richards in the discussion went on to say that it is figured that on the small furnace at Domnarfvet, which furnace was illustrated in *The Iron Age*, September 16, 1909, they could make pig iron at \$1.50 a ton less than they could in their own blast furnaces. He said that he had gathered from what was told him that they were figuring on the 4000 kw. furnace's making pig iron at \$2.50 a ton less than it could be made in the blast furnace. He said that the cost of power in Sweden is \$4 to \$8 per horsepower-year or not more than \$2 per ton, and the electrode cost at 3c. per pound would be about 33c. a ton of pig iron. The charcoal cost is one-third of a ton of charcoal. Though formerly costing \$6 per ton, charcoal now costs in Sweden \$12 a ton, so that the charcoal would now cost \$4 a ton of pig iron.

If to these costs are added that of the ore and labor, the total approximate cost is obtainable. But the real factor, he emphasized, is that  $\frac{3}{4}$  ton of charcoal, costing \$8, is contrasted with  $\frac{1}{4}$  hp.-yr., costing \$2, and the cost of the electrodes. Furnaces of course are run on a smaller scale than that of a blast furnace. A furnace of 2000 kw. capacity produces about 18 tons a day and a comparison with a blast furnace will become more interesting when we have electric furnaces making 100 tons a day. Prof. Richards said that in the next few years, the electric furnace will save several dollars per ton.

#### Toughness of Castings of Electric Steel

F. T. Snyder, secretary Bentley-Snyder Company, Chicago, said it seemed to be a fact that electrically refined steel is tougher and more resistant to shock than steel made in furnaces where a great deal of nitrogen comes in contact with the steel. Whether that is due to a friable iron nitride segregated between the crystal faces or not is a problem on which he thought a great deal of work yet needed to be done. If it is true that electric steel can now be made at a cost approaching that of open-hearth steel, he regarded it as a matter of interest whether or not electric rails are a commercial possibility. If a rail can be made which will break perhaps half as often as an existing rail of the same specifications, we have a situation, he argued, which ought to be interesting to the railroads and to the steel producers.

Prof. Richards explained in closing that charcoal is used largely because there is less sulphur to get rid of than when coke is used, but coke is used in some Norwegian furnaces because of the high price of charcoal. They run with coke and expect to make pig iron with a limit of 0.02 or 0.03 sulphur.

Since the results tabulated in *The Iron Age* of October 12, covering operating results of the electric iron smelting furnace, six electrodes are used instead of four and in the week of September 4 to 11, 1911, the furnace consumed only 336 kg. of charcoal and 1736 kw.-hr. of electric power per ton of pig iron produced with an electrode consumption of 5.5 kg. as against an earlier performance, February 11 to February 19, 1911, of 376.3 kg. of charcoal and 2149 kw.-hr. per ton of iron.

## A California Steel Dredge

California dredge builders have turned to steel for hull material. The wooden structures have proved easy prey for fire and highly susceptible to decay by moisture, while the increasing weight of hulls has forced a wearying search for suitable timbers. The first steel dredge ever constructed in California went into commission in April and made the tenth active gold-boat of the dredging fleet of the Natemas Consolidated of California. It will operate near Folsom, one of the oldest dredge towns in the State, and was designed and built by the Yuba Construction Company, Marysville. The machinery was furnished by the Bucyrus Company, South Milwaukee, Wis.

The hull has a length of 150 ft. with a width of 56 ft. The depth of hold is 10½ ft., compared with the 12 ft. demanded by wooden hulls of this type. The total weight of hull approximates 920,000 lb., contrasted with the 2,196,000-lb. wooden hulls of boats of identical size. The dredge is designed to dig 55 ft. below water level and has a theoretical capacity of approximately 450,000 cu. yd. per month.

The dredge machinery represents a weight of 1,900,000 lb. Bolts, rods and other material used in hull construction weigh about 350,000 lb. Including motors, transformers and other equipment, the dredge displaces about 3,500,000 lb. The 90 15-cu. ft. buckets are composed of three sections—hood, lip and bottom. The hood is formed of steel plate, the bottom of high-carbon and manganese steel and the lip is a manganese steel casting. The 90 bucket pins are each 33 in. long and 7¾ in. in diameter and are made of high-carbon steel. The 184 bucket bushings are of manganese steel. The entire weight of the bucket line exceeds 375,000 lb. Each bucket has an individual weight of about 3700 lb. The steel digging ladder is 119 ft. long and of plate girder construction. The tumblers are composed of high-carbon steel; the shafts of forged nickel steel and the cushion plates of chrome nickel steel. The plate steel hoppers are lined with manganese steel plates ½ in. thick. The revolving screen is protected by ¾-in. high-carbon steel plates. The screen is 50.5 ft. long and 9 ft. in diameter. The steel spud, located at the center of stern to insure an even distribution of strain, is 70 ft. long with 38 by 60-in. dimensions. Including the point, the spud has a weight exceeding 44 tons. Nine motors, ranging from 2 to 400 hp., actuate the machinery. Four pumps are used, three for washing gravel and one to furnish water to the hydraulic monitor mounted in the bow. The total electric power developed is 1072 hp., including the motors used for the operation of pumps. The dredge will operate in difficult ground, but is expected to handle gravel at an approximate cost of 2 cents per cubic yard.

The adoption of the steel hull for California dredges has been principally encouraged by the burning of several gold-boats, the wooden hulls proving particularly susceptible to fires engendered by electrical equipment. Two large dredges were thus destroyed in 1911, and it is the general opinion that the steel hull affords the best protection. Growing scarcity of large timber has also caused annoyance in late years. The wooden hulls show considerable damage from moisture after being in service for a few years. The original cost of a steel hull will not exceed that of wood in the case of the large 15-cu. ft. boats, and in some instances will be less. Steel dredges are operating successfully in South America, Alaska and other fields, and their extensive employment in California has been practically assured.

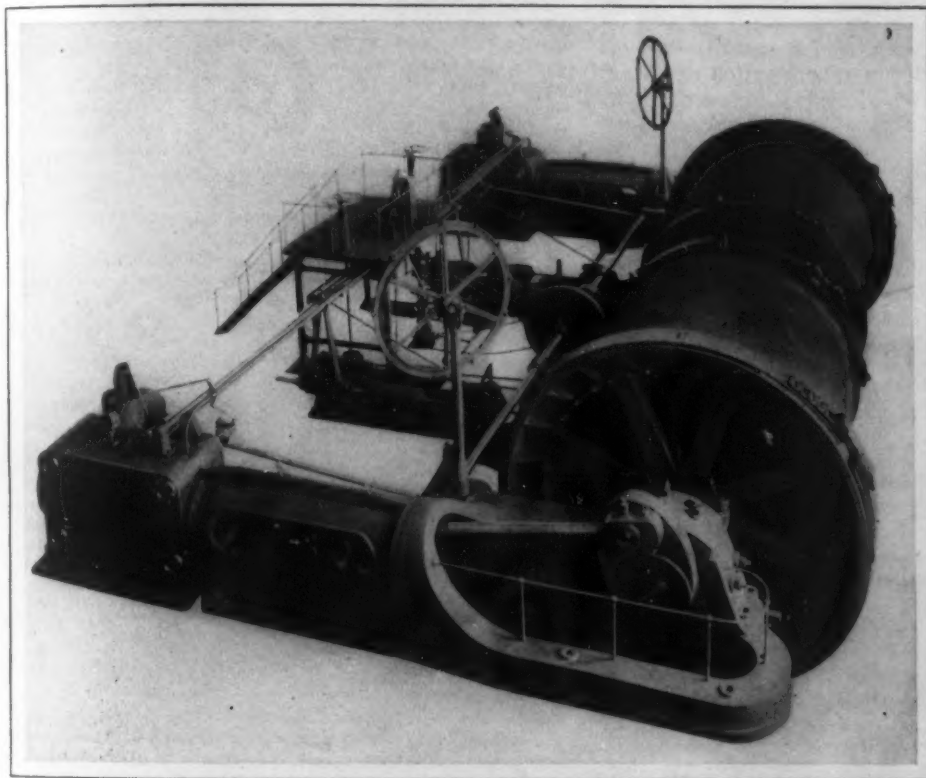
L. P. D. Yost, proprietor of the Yost Furnace Company, Canton, Ohio, has purchased the furnace business of the Bonnot Company, Canton. The manufacture of furnaces will be continued under the name of the Yost Furnace Company.



## New Large Hoisting Engine

An illustration is herewith given of the hoisting engine recently installed for the Montreal Mining Company operating on the Gogebic Iron Range at Hurley, Wis. The engine was built by the Sullivan Machinery Company, Peoples Gas Building, Chicago, Ill., and is typical of the most recent practice in hoisting engineering. The plant consists of two Corliss heavy duty type engines with 28-in. cylinders and 60-in. drums. The two winding drums are each 12 ft. in diameter, with a 12-ft. face, machine grooved for 1¼-in. hoisting cable. The drums are loose on the engine shaft and are driven with steam-operated band friction clutches.

The hoisting plant is equipped with an automatic throttle closing device for the purpose of automatically closing the throttles at any predetermined point for which they may be adjusted. The velocity of the moving masses, such as



A Large Hoisting Engine Recently Installed for the Montreal Mining Company by the Sullivan Machinery Company, Chicago, Ill.

the drums and cages, is thus reduced before the landing is reached so that in case the engineer neglects to apply the brakes they will be applied automatically. The cutting off of the steam, with the resulting slowing up in speed of the moving masses, permits the automatic brake to bring the machinery to a standstill without shock or jar. The overwinding of the skips or cages is likewise prevented.

The engine cranks are of cast steel and the crankshaft, which is 18 in. diameter and 44 ft. long, was forged in one piece from a special billet. The hoisting plant is built to lift a load of 5 tons of ore in addition to the weight of skips and cable. An overload up to 8 tons is, however, within the capacity of the plant, although the most economical steam consumption is obtained at a load between 5 and 6 tons. The shaft depth in which this plant will do the hoisting will be 3500 ft.

**A Large Australian Rail Inquiry.**—The commonwealth of Australia is taking bids for 135,633 tons of 80-lb. and 60-lb. open hearth steel rails, mostly the former, and 9,634 tons of open hearth fish plates, delivered at Fremantle and Port Augusta for the government railway system. Rails are to be delivered within 27 months and the fish plates within eight months. Bids close May 29. While British mills are expected to have the preference on this order, American rail manufacturers have taken Australian contracts, though at prices considerably below British bids.

## Air Compressor Lubrication

A booklet on "Air Compressor Lubrication," published by the Joseph Dixon Crucible Company, Jersey City, N. J., gives useful hints to users of such apparatus. In the lubrication of air compressors and pneumatic tools a common fault is to use too much oil, and oil that has too low a flash point. An air compressor does not require as much oil as a steam cylinder; in fact, it is far better to limit the use of oil to a minimum. Oil tends to cause the valves to stick, and thereby necessitates frequent cleaning. If kerosene is used to remove the deposit the valves must be taken out, although engineers have been known to introduce kerosene through the air inlet valves for this purpose. Kerosene will clean the valves, but it is also equally effective in producing an explosion. In spite of the care exercised in designing and operating compressors, disastrous explosions still occur and are usually traceable to

the presence of inflammable gas in the air lines. Such a condition is nearly always due to the improper use of lubricating oils.

The Joseph Dixon Company recommends the lubrication of air compressor cylinders with soapy water and flake graphite. Such a mixture provides economical, efficient and safe lubrication and keeps the valves clean. A little oil should be introduced when shutting down the compressor to prevent any tendency of the soap suds to cause rusting. By this method all dangers attending the use of oil are overcome. Flake graphite has a strong tendency to attach itself to metal surfaces and, when thoroughly worked into the inequalities, imparts a superficial glaze or veneering of great smoothness, high polish and endurance that prevents the actual contact of metal to

metal, and makes it possible for relatively small quantities of fluid lubricants to provide a safe and sufficient film or lubricating layer. Flake graphite is an inert mineral; its normal smoothness is quite unaffected by any degree of heat attainable in the air compressor cylinder. Under no condition can it be volatilized, carbonized or baked into a hard or gummy mass to interfere with the free action of the valves. On the contrary, its presence upon working surfaces is a guarantee of smooth operation.

## Flood Damage at Port Henry Iron Mines

The bursting of a concrete dam of Witherbee, Sherman & Co., located about one mile west of the Mineville, N. Y., iron ore concentrating plants of the company, on the night of April 23, did considerable damage to property. Two smaller dams in the path of the liberated water were carried away and two or three small bridges were destroyed. The company's central power house at Mineville was flooded, compelling the suspension of operations for two or three days. The flood swept through Millbrook valley, but timely warning was given and there was no loss of life, nor were any houses carried away, as reported. One item of Witherbee, Sherman & Co.'s loss is a stock of 1500 to 2000 tons of coal which was carried away, much of it being swept into Lake Champlain, six miles distant.

## Employers' Liability Insurance

### Casualty Companies Working on a Plan of Grading Risks

The growing necessity of employers' liability insurance, on account of the increasing number of laws relating to workmen's compensation now being enacted, has led to considerable study of the system of rates under which such insurance is paid for. The insurance companies writing this business, as well as those who are paying the premiums, have come to the conclusion that the present system leaves much to be desired.

#### Uniform Rate for an Industry Is Unscientific

Every class of business now has a single rate, which is applied to all members of that class. That is to say, one rate is given to all foundries, one to all machine shops, one to all rolling mills, etc. The individual risk is not considered, but the conditions of the class as a whole are taken into consideration and the rate is put on that basis. The amount of the premium, of course, is determined by the size of the payroll of the individual employer.

That this is an unscientific method of arriving at the rate has been conceded for some time, but the underwriters have taken the view that it was the best possible method under the conditions. The difficulty of determining the relationship between individual risks—of measuring the hazard, in other words—was obviously great, and rather than plunge into the immense task of fixing upon a schedule to be used in rating a risk and in maintaining an inspection department sufficient to apply the schedule, the companies have continued to work under the old plan.

The chief objection to this, from the standpoint of the assured, is that the careful manufacturer, who applies all the guards and safety devices possible, and who thus puts his shop in such condition that the number of accidents is reduced to a minimum, is paying for the losses of the man who is careless, who does not take all possible precautions and who has more accidents than he should have. Again, some insurance companies have inspection departments which examine risks at the time applications are received, making suggestions along the lines of reducing the hazard and generally succeeding in securing some measurable improvement in the risk. Others have accepted business without inspections, getting, as a result, risks which probably are not so desirable nor so well selected as those of the companies maintaining inspectors. As the experience of all the companies writing the business went into the statistics upon which the rates provided were based, the company which selected its risks charged the same rate as that used by the company accepting all manner of risks without examination. Obviously, the rate charged by the former was too high and the latter too low.

#### Selection and Rating of Risks Now Proposed

As stated, this situation has been recognized for some time not only by the employers who have been paying the premiums, but by the companies writing the business. It should be said, however, that the latter have made little profit thus far on this class of insurance and that it is one of the lines handled by casualty companies upon which some of the leading companies have shown losses. That the proper selection and rating of risks will tend to eliminate the inadequately equipped plant and will reduce the amount of the losses seems to be certain; and inasmuch as this will enable the companies to make money on the business and at the same time reduce rates to those whose plants are properly operated such a plan seems to contain possibilities of advantage for everybody concerned.

The Workmen's Compensation Service and Information Bureau, of which practically all of the companies writing employers' liability insurance are members, is now working on a plan of the above described character. Progress has been reported from time to time, and, while it is yet impossible to say when the new schedule will be available, it is likely that the beginning of 1913 will see it put into operation. The work is requiring an immense amount of study bearing on losses which have been experienced; on safety devices and machine guards which have been originated and which are available for various

industries, and on the relative hazard between the operation of this particular machine and that. All of these factors must be considered in working out the plan, and at the same time trained inspectors, capable of doing not merely administrative work in the application of the schedule, but constructive and creative work in the direction of securing needed improvements, must be secured and organized for the service.

#### Advantages of the New Plan

Recent comments by insurance journals show that much is expected of the new plan. The Western Underwriter of Chicago in a recent issue said:

The bureau will perform two distinct functions: First, that of conservation of human life and the prevention of accidents; second, determining the hazard of risks and expressing the measure of that hazard in a rate for each risk. The companies know from their experience the average cost of carrying each classification, and their present rates are for the "average" risk in each classification. It will be the work of the inspectors to determine the physical hazard of the risk and to estimate the moral hazard as shown in the employer's care of his plant, his compliance with factory laws and advanced provisions for accident prevention, and the class of workmen he employs; in short, all those signs and conditions which show the employer to be a careful man and desirable assured or otherwise. From the results of these observations, together with the experience on the risk, if it has been insured, it will be determined whether the risk is better or worse than the average of its class, and the rate for it made accordingly.

Aside from the advantages of frequent inspections by trained men who will point out defects to be corrected and improvements that can be made, the assured who maintains a good risk will get the advantage of a reduced rate. On the other hand, a bad risk will be penalized. In this way the companies will bring constant pressure for improvements, which will reduce accidents to a minimum. Such a service will cost a large amount of money, but it will be money well spent. There is no complaint because the steam boiler companies spend 75 to 80 per cent of their premium income for inspections and only a very small per cent for losses.

The organization of this bureau will carry forward in a more systematic and effective way the inspection work already so well inaugurated by individual companies. Adding the rating feature will remove what is perhaps the most serious valid objection to the present rates, namely, that good and bad risks under the same classification are rated alike.

The Spectator of New York commented recently on the new plan as follows:

The idea that some system of schedule rating will straighten out the perplexing situation in the liability and workmen's compensation business is a feasible one. If customers can be shown how a risk may be improved by installing certain safety devices and perfecting appliances for the proper protection of the workers it certainly seems as if the policyholder would make the changes. The plan has worked successfully in fire insurance, and it seems hard to contemplate the time when such a system was not in existence. In a great many ways the liability business is similar to the fire business as regards the possibility of periodical inspections and the installation of protective devices. Why, then, should it not be possible for the liability companies to hit upon some safe and sane plan for giving the careful policyholder the benefit of lower rates?

As suggested, the chief difficulty at present is getting the assured to spend the money necessary to secure the devices which will protect his machines. He has paid his premium and he feels that he is "covered." If the expenditure becomes an investment, in that he secures a reduction in the premium, he has an immediate incentive to make the suggested improvements in his plant. As in fire insurance, the policyholder who spends most to prevent a loss is not only working for the company but for himself, enabling his plant to continue with the least amount of friction and interruption of operations, and getting a lower rate for his insurance. It is safe to say that the iron and steel interests will welcome the adoption of the proposed system of rating.

The National Engine & Mfg. Company, Girard, Ohio, which is located in the plant formerly occupied by the Girard Foundry & Machine Company, expects to place its plant in operation about May 15. Considerable new machinery has been installed. The company will manufacture rotary steam engines, metallic railroad ties and rail joint splices, and will do a general business in heavy and light foundry work, high-pressure steam fitting, hydraulic and pump work, pipe bending, pattern work, etc.

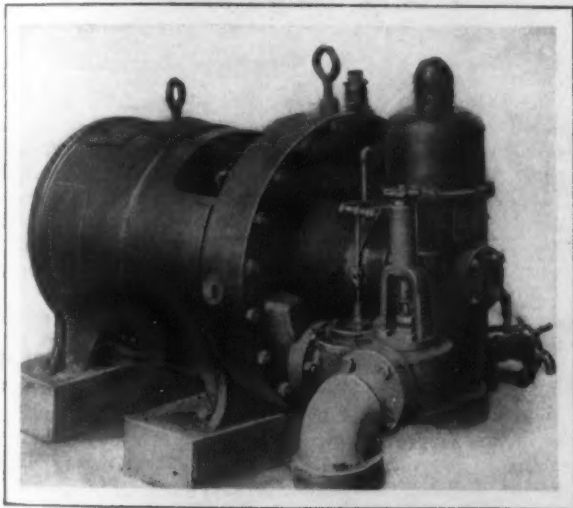


## A Direct-Current Turbo-Generator

A direct-current turbo-generator unit known as Type T has been brought out by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. The special field which this unit is designed to cover is as an exciter set in a plant generating alternating current where the steam pressure exceeds 125 lb. per square inch. Other uses are to generate the current for light and power in industrial plants and office and apartment buildings, for storage battery charging and railroad signal work and train lighting. The turbines operate on pressures up to 200 lb. and with steam superheated to 150 deg. F.

In the accompanying engraving is shown a 25-kw. 125-volt unit which operates at a speed of 3500 r.p.m. and is one of two sets providing the excitation for the turbo-alternators in the plant of the New York & Nassau Construction Company, Douglaston, N. Y. The line of sets built includes machines of 10 to 200 kw. and these are wound for voltages of 125 and 250.

The turbine which is designed for operating with a steam pressure of from 75 to 200 lb. is of the single wheel impulse type, and the wheel or rotor is mounted directly at the end of the generator shaft. Although only one impulse wheel is used, it is emphasized that an unusually high efficiency is obtained by using the steam two or more times in the one wheel. The governor is of the fly-ball type and the weights are hung on hardened steel knife



One of a New Line of Direct-Current Turbo-Generators Built by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

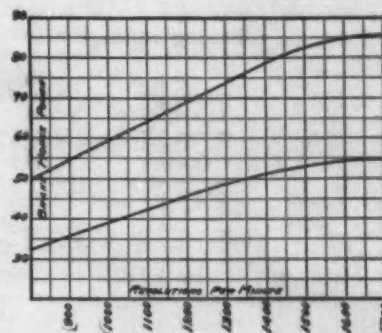
edges to minimize the friction. Over-speeding is prevented by an automatic safety stop throttle valve, which trips when the normal speed is exceeded and shuts off the steam supply. All the parts of the turbine are readily accessible for inspection or repair, and the upper half of the casing can be removed without interfering with the valve or governor mechanism. If desired the rotor can also be entirely removed from the casing. The steam consumption of these turbines is guaranteed, the figures being based upon the results of tests in the builder's shop before shipment, with the addition of an ample margin.

## Hearings to Begin in the Steel Corporation Suit

Henry P. Brown, Philadelphia, has been appointed examiner to take testimony in the suit brought by the Government for the dissolution of the United States Steel Corporation. Hearings will begin May 6 in the United States Customs Building, New York. It is expected that most of the sessions will be in New York in view of the fact that the records of the Steel Corporation are there. It may require two years for the final adjudication of the case. More witnesses will be examined than in the Standard Oil and Tobacco company cases. It is expected that the Government's case will largely center on the iron ore and railroad holdings of the Steel Corporation and will be based, to a great extent, on the report of Herbert Knox Smith, Commissioner of Corporations.

## Test of an Aeronautical Motor

Horsepower curves have been plotted from tests made upon both the four and six-cylinder aeronautical motors



Power Curves of Sturtevant Aeroplane Motor

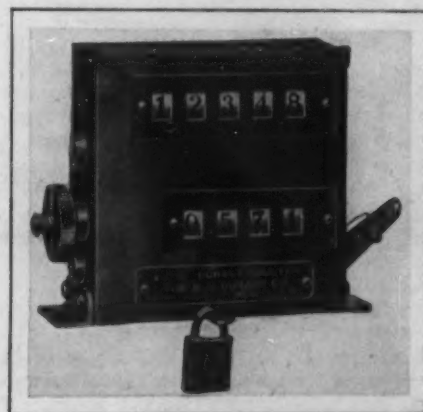
of the Sturtevant Company, Hyde Park, Mass., direct connected to an absorption dynamometer and show the high efficiency which these motors develop in operation. A comparison of the A. L. A. M. rating for motors of the same bore and stroke with the actual performance of these motors is very interesting as shown in the following table:

|   |        |
|---|--------|
| 4-Cylinder, 4½-in. Bore and 4½-in. Stroke |        |
| A. L. A. M. rating, 1332 r.p.m.....       | 32 hp. |
| Actual performance, 1332 r.p.m.....       | 50 hp. |
| 6-Cylinder, 4½-in. Bore and 4½-in. Stroke |        |
| A. L. A. M. rating, 1332 r.p.m.....       | 48 hp. |
| Actual performance, 1332 r.p.m.....       | 76 hp. |

It will be seen from the accompanying chart that both motors reach the peak of their curves at about 1700 r.p.m., at which speed they develop 55 hp. and 86 hp. respectively.

## A Special Counter

The W. N. Durant Company, 523 Market street, Milwaukee, Wis., has brought out a new type of special counter for peculiar uses which is known as the model E. This device has a row of figures for recording totals of operations and another for tallying short runs or parts of a complete operation. The figures in the totalizing counter



The New Type E Counter Which Gives a Total Record as Well as One for Short Runs Made by the W. N. Durant Company, Milwaukee, Wis.

cannot be reset without unlocking the lid of the case, while the lower and shorter row can be reset to zero instantly by a single turn of the large thumb nut at the left of the case. The counter is made with two forms of resetting device, both of which are included within a single case. In this way practically two complete counters driven by a single lever and capable of being reset independently are available.

The Gealy Wrench & Mfg. Company, Grove City, Pa., reports a marked increase in its business necessitating the doubling of the size of its factory. At the present time a miniature working model of its No. 00 wrench, which will weigh about 8 oz., is being gotten out for use as a salesman's model. It is the company's purpose to furnish these models to jobbers for their salesmen.

The Bridge Builders' Society will meet in the Blackstone Hotel, Chicago, on Thursday, May 9. At this meeting the standard contract forms for structural work and erection, which have been under discussion by the society for several months will probably be adopted.

## The General Electric Company's Report Net Profits \$292,887 Less in 1911 than in 1910

The twentieth annual report of the General Electric Company covers the calendar year 1911. The financial results of the year make the following comparison with the previous year:

|                            | 1911         | 1910         |
|----------------------------|--------------|--------------|
| Total receipts .....       | \$73,394,377 | \$74,707,689 |
| Expenses and interest..... | 62,831,572   | 63,841,996   |
| Net profits .....          | \$10,562,805 | \$10,855,692 |
| Dividends .....            | 5,806,344    | 5,214,368    |
| Balance .....              | \$4,756,461  | \$5,641,324  |
| Previous surplus .....     | 23,022,706   | 17,381,381   |
| Total surplus .....        | \$29,019,892 | \$23,022,706 |

Of the above receipts in 1911 the sales billed represent \$70,383,854, against \$71,478,557 in 1910. They do not include the business of the Fort Wayne and the Sprague electric companies taken over June 1, but the surplus of those companies, \$1,240,725, is included in the total surplus for 1911.

Non-filled orders, December 31, amounted to \$15,200,000, against \$15,000,000 a year previous.

The balance sheet, as of December 31, which includes the assets and liabilities of the Fort Wayne and Sprague companies in 1911, compares as follows:

| Assets:                              | 1911          | 1910          |
|--------------------------------------|---------------|---------------|
| Patents, branches and good will..... | \$1           | \$1           |
| Factory plants .....                 | 19,538,924    | 15,516,314    |
| Other real estate .....              | 448,094       | 345,719       |
| Stocks and bonds .....               | 28,707,843    | 23,666,883    |
| Accounts and notes received.....     | 19,084,105    | 19,047,459    |
| Inventories .....                    | 26,429,984    | 27,796,276    |
| Work in progress.....                | 399,707       | 589,788       |
| Cash .....                           | 17,898,709    | 14,912,400    |
| Copper mining investment.....        | 147,153       | 2,805,077     |
| Due from allied costs.....           | 2,891,760     | 2,923,483     |
| Total .....                          | \$115,399,131 | \$107,767,017 |
| Liabilities:                         |               |               |
| Capital stock .....                  | \$77,335,200  | \$65,179,600  |
| Debentures .....                     | 2,806,000     | 14,962,000    |
| Accrued interest .....               | 33,014        | 83,664        |
| Accounts payable .....               | 4,305,172     | 2,796,230     |
| Dividends payable .....              | 1,545,654     | 1,303,592     |
| P. & L. surplus .....                | 29,019,892    | 23,022,706    |
| Advance payments on contracts.....   | 147,153       | 245,819       |
| Accrued taxes .....                  | 207,043       | 173,045       |
| Total .....                          | \$115,399,131 | \$107,767,017 |

During the year \$769,842 was expended for the purchase of sundry patents, for applications and licenses under patents, patent litigation, and miscellaneous expenses, all of which has been charged to profit and loss as heretofore, leaving patent account at \$1.

Certain securities have been acquired and others sold, and all the stocks and bonds owned have been carefully re-valued, with the result that, at December 31, 1911, their par value of \$27,264,086 was carried on the books at \$28,707,843.

The copper mining investment has been written off against surplus.

On December 31, 1911, the book value of current accounts and notes receivable was \$19,084,106 after allowance for losses and adjustments. Of the accounts receivable, the total face value of unsettled accounts originating prior to January 1, 1911, was \$871,514. In addition, there was due from affiliated manufacturing and selling companies \$2,891,760, making a total book value of all notes and accounts receivable of \$21,975,866.

On January 31, 1893, the book value of the Schenectady, Lynn and Harrison plants was..... \$3,958,528  
During the 19 fiscal years to December 31, 1911, expenditures have been made, including the cost of acquiring the Pittsfield plant, aggregating..... 46,211,476

Total .....

Written off during the 19 years..... 33,297,949

Book value of above plants at December 31, 1911.....\$16,873,054

To the above have been added the value of the new plant under construction at Erie, Pa., (the property of the Pennsylvania General Electric Company having been transferred to the General Electric Company) and the values of the Fort Wayne and Sprague companies. Including these, the book value of factory plants, at December 31, 1911, was as follows:

|                   |              |
|-------------------|--------------|
| Schenectady ..... | \$9,125,720  |
| Lynn .....        | 4,283,763    |
| Pittsfield .....  | 2,148,699    |
| Lamp Works .....  | 1,314,871    |
| Erie .....        | 1,355,834    |
| Fort Wayne .....  | 938,102      |
| Sprague .....     | 371,930      |
| Total .....       | \$19,538,921 |

In addition to giving the above information, President C. A. Coffin says: "The action brought by the United States against your company and others in connection with the manufacture and sale of incandescent lamps has been terminated by the entry of a decree. In compliance with this decree, the National Electric Lamp Company and its subsidiary companies, operating under patent licenses granted by the General Electric Company, will immediately be dissolved. The plants and properties of these companies will be taken over and operated by the General Electric Company as part of its organization. It is believed that the business of your company, in all of its various branches, is now being conducted in such a manner as to avoid any possible ground for criticism as contravening the anti-trust law."

## The Otis Steel Company's Reorganization

The reorganization of the Otis Steel Company, Cleveland, Ohio, which was recently changed from an English to an Ohio corporation, with headquarters in Cleveland instead of London, has been completed. George Bartol, formerly general manager, is president and treasurer. Harry E. Higgins, formerly treasurer and general manager of the Cleveland Steel Company, is vice-president. H. F. Deverell is secretary, holding the same official position as he did in the former company. T. Frame Thompson of London, former president, is executive chairman. The directors are the four officers named above and J. Edward Touche of London, formerly managing director. The new company has an authorized capitalization of \$15,000,000.

Vice-President Higgins will devote himself for some time to work in connection with the company's new steel plant and blast furnaces, preliminary plans for which have been prepared. The location of the plant is as yet unsettled, owing to the fact that the application of the company for filling in the lake adjoining its present plant to provide a site has not yet been acted upon by the Federal authorities or the city of Cleveland. The company will go ahead with its plant as rapidly as possible and will place orders for its equipment to be installed either on the desired site or, if that is not secured, on some other site to be selected later. Preliminary work in connection with the new plant has been delayed considerably, owing to the illness of Mr. Higgins from last December until quite recently. His numerous friends will be glad to know that his condition is greatly improved and he is apparently on the way to complete recovery. He has opened offices in the Hippodrome Building, Cleveland, where much of the work in connection with the new plant will be carried on. The company maintains its new general offices at the plant.

The dock companies that handle ore at Lake Erie ports are being reorganized to comply with the ruling of the Interstate Commerce Commission which prohibits shippers from operating or being financially interested in dock companies. Three new companies have been incorporated in Ohio to succeed former dock companies. The Pollock-Becker Company, Cleveland, will succeed the Union Dock Company, Ashtabula, and will handle ore for the Lake Shore Railroad at that port, the principals in the company being W. J. Pollock and W. H. Becker. The Erie Dock Company, Cleveland, will succeed the N. Y. P. & O. Dock Company and handle the ore of the Erie Railroad. The Ashtabula & Buffalo Dock Company will take over the properties of the Ashtabula Dock Company, Ashtabula, and the West Shore Dock Company, Buffalo.

California is the only State which makes a commercial production of borax. The output for 1910, according to the United States Geological Survey, was 42,357 net tons, valued at \$1,201,842. Less than four tons was imported. About one-half of the borax consumed is used in the enameling industry for making kitchen and sanitary ware. Each year some new use is found for the mineral.

Officials of the Great Northern Railway Company deny the report from Canada that James J. Hill and associates have purchased two miles of water front near Fort William on Lake Superior as a site for blast furnaces and steel works. The denial goes further and states that no land has been purchased in that vicinity for any purpose whatever.



Ratio of Copper to Pig-Iron Consumption \*

Copper Production Must Increase to Keep Pace with Pig Iron

BY DR. JAMES DOUGLAS, NEW YORK

The high price of copper has excited speculation as to its cause. The following statistics may help to solve the problem. They give the quantity of pig iron and copper consumed in the United States in the 16 years from 1896 to 1911, and the quantity of pig iron and copper consumed by the world in the 15 years from 1896 to 1910. The column of production of iron for this country represents approximately its consumption, inasmuch as the trifling imports of iron and steel are nearly balanced by our exports. The home consumption of copper is taken from "The Mineral Industry" and is calculated on the production, plus importation, minus exports. As larger or smaller quantities are carried in stock from year to year, the following years are bracketed, namely, 1897 and 1898, 1899 and 1900, 1906 and 1907. These couples then correspond approximately with the average and with the consumption of other years. The figures also closely bear out those that I prepared on this subject for the Journal of April 7, 1906, and are confirmed by Brown and Turnbull in their "Century of Copper."

Domestic Production and Consumption of Pig Iron and Copper, 1896-1911.

| Year | Pig iron produced and consumed. |                      | Pig copper produced |                      | Per cent of copper to iron | Tons pig iron produced to one ton of copper | Copper consumed gross tons. | Tons of pig iron consumed to one ton of copper |
|------|---------------------------------|----------------------|---------------------|----------------------|----------------------------|---|-----------------------------|--|
|      | Gross tons                      | Per cent of increase | Gross tons          | Per cent of increase |                            |   |                             |  |
| 1896 | 8,623,127                       | ....                 | 208,760             | ....                 | 2.42                       | 41  | 102,083                     | 83   |
| 1897 | 9,652,680                       | 11.94                | 223,825             | 7.22                 | 2.32                       | 43  | 122,501                     | 87   |
| 1898 | 11,773,934                      | 21.97                | 239,241             | 6.89                 | 2.03                       | 49  | 122,382                     | 96   |
| 1899 | 13,620,703                      | 15.68                | 259,517             | 8.47                 | 1.91                       | 52  | 174,822                     | 78   |
| 1900 | 13,789,242                      | 1.24                 | 268,229             | 3.36                 | 1.95                       | 51  | 155,169                     | 83   |
| 1901 | 15,878,354                      | 15.15                | 271,949             | 1.39                 | 1.71                       | 58  | 196,836                     | 81   |
| 1902 | 17,821,307                      | 12.23                | 288,342             | 6.03                 | 1.62                       | 62  | 213,300                     | 84   |
| 1903 | 18,009,251                      | 1.05                 | 319,043             | 10.65                | 1.77                       | 56  | 224,026                     | 80   |
| 1904 | 16,497,033                      | *8.50                | 372,233             | 16.35                | 2.25                       | 44  | 215,264                     | 77   |
| 1905 | 22,992,380                      | 39.38                | 390,733             | 4.97                 | 1.70                       | 59  | 273,653                     | 84   |
| 1906 | 25,307,191                      | 10.07                | 409,652             | 4.84                 | 1.62                       | 63  | 298,472                     | 83   |
| 1907 | 25,781,361                      | 1.87                 | 392,518             | *4.18                | 1.52                       | 66  | 240,098                     | 90   |
| 1908 | 15,936,018                      | *38.19               | 423,302             | 7.84                 | 2.66                       | 38  | 218,153                     | 73   |
| 1909 | 25,795,471                      | 61.86                | 493,453             | 16.57                | 1.99                       | 52  | 313,905                     | 82   |
| 1910 | 27,298,545                      | 5.83                 | 484,933             | *1.72                | 1.78                       | 56  | 339,132                     | 80   |
| 1911 | 23,647,451                      | *13.37               | 491,647             | 1.38                 | 2.08                       | 48  | 316,350                     | 75   |
|      | 292,424,048                     | 9.21                 | 5,537,377           | 6.01                 | 1.89                       | 53  | 3,526,146                   | 83   |

\*Decrease.

The World's Production and Consumption of Pig Iron and Copper, 1896-1910

| Year | Pig iron produced and consumed. |                      | Pig copper produced |                      | Per cent of copper to iron | Tons pig iron produced to one ton of copper | Copper consumed metric tons | Tons of pig iron consumed to one ton of copper |
|------|---------------------------------|----------------------|---------------------|----------------------|----------------------------|---|-----------------------------|--|
|      | Metric tons                     | Per cent of increase | Metric tons         | Per cent of increase |                            |   |                             |  |
| 1896 | 31,015,302                      | ....                 | 384,493             | ....                 | 1.24                       | 81  | 384,500                     | 81   |
| 1897 | 33,513,073                      | 8.05                 | 412,088             | 7.18                 | 1.23                       | 81  | 390,081                     | 86   |
| 1898 | 36,658,272                      | 9.39                 | 440,972             | 7.01                 | 1.20                       | 83  | 439,254                     | 83   |
| 1899 | 40,457,341                      | 10.36                | 478,200             | 8.44                 | 1.18                       | 85  | 467,700                     | 86   |
| 1900 | 39,599,457                      | *2.12                | 499,200             | 4.39                 | 1.26                       | 79  | 512,700                     | 77   |
| 1901 | 40,950,692                      | 3.41                 | 534,800             | 7.13                 | 1.30                       | 77  | 494,200                     | 83   |
| 1902 | 44,342,579                      | 8.28                 | 553,300             | 3.46                 | 1.25                       | 80  | 582,500                     | 76   |
| 1903 | 47,113,730                      | 6.25                 | 591,300             | 6.87                 | 1.26                       | 80  | 586,700                     | 80   |
| 1904 | 46,069,501                      | *2.22                | 647,900             | 9.57                 | 1.41                       | 71  | 662,400                     | 70   |
| 1905 | 54,054,783                      | 17.33                | 693,900             | 7.10                 | 1.28                       | 78  | 727,400                     | 74   |
| 1906 | 59,074,861                      | 9.29                 | 712,900             | 2.74                 | 1.21                       | 83  | 722,600                     | *82  |
| 1907 | 60,680,014                      | 2.72                 | 703,000             | *1.39                | 1.16                       | 86  | 657,300                     | 92   |
| 1908 | 48,640,479                      | *19.84               | 744,600             | 5.91                 | 1.53                       | 65  | 698,300                     | 70   |
| 1909 | 61,217,064                      | 25.86                | 854,100             | 14.70                | 1.40                       | 72  | 782,800                     | 78   |
| 1910 | 65,860,260                      | 7.58                 | 866,640             | 1.47                 | 1.33                       | 76  | 861,000                     | 76   |
|      | 709,247,408                     | 6.03                 | 9,117,393           | 6.04                 | 1.29                       | 78  | 8,969,435                   | 79   |

\*Decrease.

The production of copper shows slighter variations than that of iron, due to the fact that copper mines, being unprotected by the tariff, have no inducement to restrict their output to the demands of a home market, but have for many years sustained commercial relations with the world at large.

What is peculiarly interesting is the ratio of the consumption of copper to that of iron. During the 16 years covered by the table the consumption of the United States

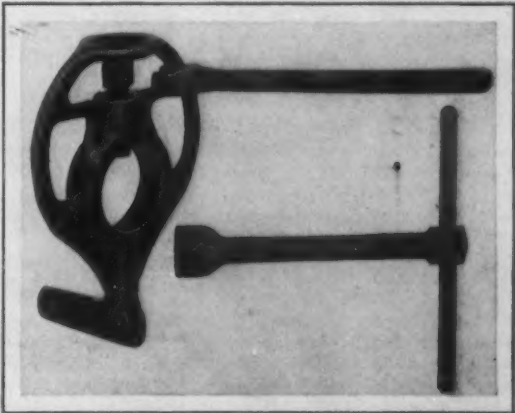
\*From the Engineering and Mining Journal, New York.

has been one ton of copper to 83 tons of pig iron, whereas during the 15 years illustrated in the table of the world's consumption of copper the ratio has been one ton of copper to 79 tons of iron. So uniform is the proportionate use of the rarer to the baser metal the world over that the ratio of the consumption of copper to iron has never risen above 1:71, nor fallen below 1:86. There have been years of extraordinary divergence from this ratio, but they are rare. For instance, during 1910 the percentage increase of pig iron over 1909 was 7.58 per cent., though the average for 15 years was only 6.03 per cent., while the increase of copper production in 1910 over 1909 was only 1.47 per cent., as against 6.04 per cent. for the average. If, therefore, there has been a demand for copper in the ratio of one ton of copper to 79 tons of iron, and if that ratio is to be maintained, the measure of value of copper must be measured by the capacity of the world's copper mines to keep pace with the demand for iron and the capacity of the world's iron mines to meet that demand.

Viewing the world's sources of supplies of rich iron ores compared with the world's scanty sources of supply of correspondingly rich copper ores, the visible supply of iron is in excess of the visible supply of relatively rich copper ores; and therefore a lower grade of copper ore must be steadily drawn upon to supply the world's increasing demand, and this demand, if provided from leaner and still leaner ores, can only be satisfied at what certainly will not be a low price.

Safety Dog for Lathes

Projecting set screws are entirely eliminated in a new safety lathe dog that has been brought out by the West Steel Casting Company, Cleveland, Ohio. There is always danger that a projecting set screw in a lathe dog will catch in the clothing and this safety lathe dog was designed



A Safety Dog for Lathes in Which Projecting Set Screws Have Been Eliminated Made by the West Steel Casting Company, Cleveland, Ohio

to remove that danger. The accompanying illustration shows the lathe dog and wrenches for operating the set screw. The standard open end wrench is to be used at the lathe and any wrench fits the dog. The standard socket wrench is to be used only to remove the set screw when damaged and can be kept in the tool room.

**Factory Location.**—An interesting brochure entitled "The Philosophy of Factory Location" has been issued by the Mobile Progressive Association, Mobile, Ala. While this publication is intended to direct attention to the advantages for manufacturing possessed by Mobile, it is unique in setting forth the general principles which should govern manufacturers looking for a new location so as to guide their decision with more than narrow considerations immediately connected with a special point. The various elements to be considered are not only set forth in diagrammatic form, but are analyzed under specific headings.

Shipment of zinc ore by river from southeastern Kansas has been resumed, the first tow of barges of record having been handled by the Kansas City-Missouri River Navigation Company the past week. Plans are under way for the increasing of the service from the ore district to the furnaces in the Kansas City district.

## Correspondence

### "Composition of High Speed Tool Steel"

*To the Editor:* The writer has read with much interest E. T. Edwards's contribution under the above title in *The Iron Age* of April 18, 1912. This article is of great value and those who have been engaged in making efficiency tests on various high speed steels will appreciate the tremendous amount of work represented in the tests reported by Mr. Edwards.

There is one point in connection with the paper to which I should like to call attention by way of correction, and that is in reference to the origin of what Mr. Edwards terms the "superior type of high speed steels"; in other words, high speed steels containing vanadium. Mr. Edwards cites Fred W. Taylor's grouping of tool steels historically, viz.: Group A, which is known as the era of carbon steels ending 1894; group B, known as the era of Mushet or air-hardening steels, 1894-1900, and group C, known as the era of high speed steel from 1900 to —. He then says:

The time left blank after 1900 by Mr. Taylor has now been closed and a new era has been reached. This we will group under D and call the era that of superior high speed steels. The old era closed and the new era began when Dr. Arnold made the startling announcements in England, early in 1909, that a new high speed steel had been discovered that would do from four to seven times the amount of work done by other high speed steels and at increased speeds.

This statement, in conjunction with a quotation from a paper by Professors Arnold and McWilliams entitled "The Iron and Steel Industries of Sheffield," which appeared in the *Journal of the Society of Chemical Industry*, Vol. XXX, 1911, has seemed sufficient cause to present some facts bearing on the question of priority in the introduction of improved or superior high speed steel.

#### THE ADVANCE IN AIR HARDENING STEEL.

On page 996 of the volume referred to above we read:

About 1900 the Americans showed the world that more could be done with this type of steel (air hardening) than had been done formerly, but almost immediately Sheffield repelled the invasion of this apparent formidable rival, and producing a still better type of high speed steel, as the latest arrival was called, carried the war into the enemy's camp with most marked success. The Sheffield steel contained anywhere from 10 per cent. to 20 per cent. of tungsten, with 2 per cent to 6 per cent. of chromium, very much lower carbon than formerly, and it is hardened from about 1300 deg. C. Still more recently, in 1908, another improved high speed steel was produced in Sheffield by means of the addition of one or other of the rare elements, a modification which it is said produces a steel that lasts four times as long as the previous best high speed steel—a result which caused very considerable sensation throughout the metallurgical world.

It is apparently this last improved steel to which Mr. Edwards refers in the paragraph already quoted. In Mr. Taylor's article on "The Art of Cutting Metals," which appeared in the proceedings of the American Society of Mechanical Engineers in November, 1906, he says: "In 1906 the discovery was made that by adding a small quantity of vanadium to tool steel to be used for making modern high speed chromium tungsten tools, heated to near the melting point, the red hardness and endurance of tools as well as their cutting speeds are materially improved." In explanation, we should say that this is one of a series of discoveries which Mr. Taylor gives as the result of his investigations during a period of 26 years. It is only fair to him, also, to add that at the beginning of this list of discoveries he states: "The writer has no doubt that many of the discoveries and conclusions which mark the progress of this work have been and are well known to other engineers and we do not record them with any certainty that we were the first to discover, or formulate, them but merely to indicate some of the landmarks in the development of our own experiments which were to us new and of value."

#### A 1905 PATENT ON THE USE OF VANADIUM

In connection with the discussion of Mr. Taylor's paper, W. H. Blauvelt calls attention to this discovery of the value of vanadium as a useful addition to high speed steels and says:

I think it will interest Mr. Taylor to know that patent No. 779,171 was issued on January 3, 1905, to John A. Mathews for the use of vanadium in both molybdenum and tungsten steels of the high speed type. This patent was mentioned in the *Electro-Chemical Industry* in February, 1905, and also in the *Journal of the Society of Chemical Industry*, February 15, 1905. This patent was applied for some six months before its issue and the first experiments bearing on the subject were made in 1903. I know that Mr. Taylor will be interested in the corroboration of his discovery by the results of earlier experience along the same line. This is manifestly one of the frequent cases of the discovery of the same idea by a number of independent workers along the same line of investigation.

To this Mr. Taylor replied: "I have not yet had the opportunity to read the patent referred to by Mr. Blauvelt. Mr. Blauvelt justly says, however, that it is not a matter of surprise that similar investigations should be carried on by two different sets of people entirely without knowledge on the part of either. This is a matter of very frequent occurrence."

#### OTHER EXPERIMENTS WITH VANADIUM

At several places in his paper Mr. Taylor mentions the use of vanadium and discusses its behavior in high speed steels. He quotes an analysis as follows:

|                |       |
|----------------|-------|
| Carbon .....   | 0.68  |
| Chromium ..... | 5.95  |
| Tungsten ..... | 17.81 |
| Vanadium ..... | 0.32  |

which he states is the best high speed with which he had experimented up to 1906, the time when his paper appeared.

James M. Gledhill, in his paper on "The Development and Use of High Speed Tool Steels," published in the *Journal of the Iron and Steel Institute* in 1904, speaks of having substituted vanadium for chromium in high speed tool steels and states that while the vanadium when used in cutting a steel of medium hardness stood well, yet it did not do better work than tools containing the element chromium.

Mr. Taylor states that his experiments indicate that vanadium should not be substituted for chromium, but that a minute quantity of vanadium should be added to supplement the effect of the other elements.

When we bear in mind that in 1900 vanadium was a chemical curiosity and was quoted, in 1901, at about \$75 per lb. and that, in 1902, the entire visible supply in this country consisted of about 100 lb. of ferrovanadium in the hands of two metal dealers in New York, it will be seen that the Americans very early took up the use of this element after its price had reached anywhere near a commercial figure and the first of this material that the writer used cost about \$12.50 per lb. While it is not certain that he was the first to use vanadium in high speed steel in an experimental way, it is a matter of record that the patent, above referred to, is the first public reference to the use of the material and the patent was based upon experiments conducted during the two years previous to its issue.

#### PROFESSOR ARNOLD ANTICIPATED BY THREE YEARS

As the result of these early experiments, steel known commercially as Rex AA was developed by the Crucible Steel Company of America, and this was a commercial product freely made and sold at least three years prior to the date stated by Mr. Edwards as the beginning of the era of superior high speed steels. Other American makers were using vanadium at a very early date and Mr. Taylor himself used it early in 1906. Steel of the same type quoted by Mr. Taylor as being the best high speed steel at that time was made by the Atha Works in 1904 and 1905 but was not largely marketed.

The era of superior high speed steels as a commercial success, therefore, dates from the time that the Rex AA steel was put on the market, and it was an English duplicate of this steel which Professor Arnold discussed in London in 1908 and which was hailed as a great metallurgical discovery. In fact, the New York daily papers devoted columns to it on their front pages, and treated it editorially, one of the editors even "wondering how long it would take the Americans to catch up."

The American tool manufacturers are, therefore, not only entitled to the original discovery of high speed steel but also to the improved, or superior, type of high speed steels, and it seems about time that credit for this im-



provement was given where credit is due, for, in this country, the effect of vanadium on high speed steels was a matter of common knowledge among those skilled in the art several years prior to 1908, and steels containing this element were commercial products three years prior to that time.

There is one other point in connection with the history of high speed steels to which it is well to call attention, because there is a common error in the minds of those using high speed steels even to-day, as to the nature of the Taylor-White claims. Mr. Taylor himself has endeavored to dispel this error in his paper already referred to, but we quote again what he says in reference to it:

Perhaps at least four out of five writers on the subject of high speed tools speak of the "discovery" or "introduction" of high speed steels, as though our invention consisted of the discovery of a tool steel new in its chemical composition. The fact is, however, that tool steel of excellent quality for making high speed tools existed and was in common use several years before our discovery was made.

In other words, Mr. Taylor himself lays stress upon a new treatment to develop increased cutting qualities rather than to a type or analysis of steel.

Syracuse, N. Y., April 26, 1912. JOHN A. MATTHEWS,  
Operating Manager, Halcomb Steel Company.

### The Personal Equation in Accident Prevention

*To the Editor:* Death with awful horrors for 1652 souls and suffering for 708 survivors and thousands of relatives and friends could all have been avoided by the vigilant use of an eye, reinforced by magnifying lenses. Here was the largest boat in the world, built supposedly with the greatest safeguards that could be conceived, and millions were spent in perfecting them. It goes down, carrying hundreds of human beings to death, because of the failure to keep such a lookout as a child might have suggested as a necessary precaution.

The writer was the first to organize a society in this country strictly devoted to the prevention of accidents, and spent much time and money in aid of it. In this work he laid the greatest stress upon the personal equation. Every now and then we read of disasters that no mechanical safeguard alone could have prevented because of the lack of proper care or precaution by one or more individuals.

Binoculars costing but a few dollars, held to the eyes of a careful man, could have prevented the great loss of life and the suffering of thousands that the sinking of a \$10,000,000 boat has caused; but a shipload of these aids to vision could not have availed were not one of them in the hands of a vigilant lookout.

One might write columns on the lessons the sinking of the Titanic brings to employers and employees, but I will take only space to say that while all practicable safety devices should be installed, a great deal more attention must be paid to keeping all the human powers alert and at their best so that they will not fail when put to the test. In this the employee as well as the employer has responsibilities; and if these are ignored we could provide safety devices until one could scarcely see the machinery for the incumbrance, and yet at times be obliged to record disasters making all humanity tremble.

The sooner the personal equation is recognized and emphasized as of equal importance with dumb, visionless safety devices, the sooner will we decrease the world's minor accidents, as well as the appalling ones, more nearly to that minimum which is beyond human care and precaution.

THOMAS D. WEST.

CLEVELAND, OHIO, April 27, 1912.

The utilization of blast furnace gas for drying molds and similar work in the foundry has been practiced in Germany. The gas, in its passage through the pipes, is caused to pass over a wire basket containing lumps of calcium carbide, which absorb moisture from the gas and, it is stated, give off acetylene. Means must be provided for shaking the basket periodically to free it from accumulations of calcium oxide.

La Follette furnace, La Follette, Tenn., was recently blown out for minor repairs, with the expectation of starting again within two weeks.

### The H. W. Johns-Manville Company Moves to Larger Quarters

The executive offices and New York show rooms of the H. W. Johns-Manville Company, manufacturer of asbestos, magnesia and electrical supplies, were moved April 20 to the new 12-story H. W. Johns-Manville Building, Madison avenue and Forty-first street, from the old quarters at 100 William street, where they have been located for the past 15 years.

This move marks the fifty-fourth anniversary of the company. Under the name of H. W. Johns Mfg. Company, the business was conducted at 87 Maiden Lane previous to May 1, 1897, when it was moved to 100 William street. In 1901 the name was changed to H. W. Johns-Manville Company, a consolidation being effected of the Manville Covering Company, Milwaukee, Wis., and H. W. Johns Mfg. Company. This last combination brought together two of the largest manufacturers of pipe and boiler coverings, packings, roofings, etc., in the world, and the growth of the business since that time has been almost phenomenal.

The company now has factories located in Brooklyn, N. Y., Milwaukee, Wis., West Milwaukee, Wis., Hartford, Conn., Nashua, N. H., Lockport, N. Y., and Newark, N. J., with an asphalt refinery at South Amboy, N. J., and extensive asbestos mines at Danville in the province of Quebec, Canada, which are the largest in existence and produce an exceptionally fine grade of asbestos. It also has a branch house in every city of any size in the United States and Canada, as well as representatives in about all foreign countries.

In the new quarters the company will have the distinction of being one of the few manufacturing concerns which occupy an entire 12-story office building. In its entirety, the company now occupies over 2,657,160 sq. ft. of floor space, or about 61 acres. The employees number approximately 5000 and there are about 425 salesmen. Increased business interests in this and other parts of the country have necessitated the move. The large floor area and spacious rooms in the new building will enable a much larger and more complete stock of goods being carried than heretofore, and will also permit of a better supervision over the company's long chain of branch offices, warehouses, stores and factories.

### The Golden Steel Company's Agencies.

The Golden Steel Company, 456 to 460 Fourth avenue, New York, has been appointed sole agent in the United States for the full line of ferroalloys and metals manufactured by Hermann Essing & Co., Koln, Germany. These include ferroaluminum, ferrochromium, ferromanganese, ferromolybdenum, ferronickel, ferrophosphorus, ferrosilicon, ferrotitanium, ferrozinc, ferrovanadium, ferrotungsten and ferrochromium-nickel; manganese alloys with chromium boron, nickel, phosphorus, titanium, zinc and tin; nickel alloys with chromium, molybdenum and tungsten; silico-manganese and silico-manganese-aluminum; silicon and silico-spiegel; metallic vanadium, tungsten, molybdenum, calcium, cobalt, cadmium, magnesium, thallium, bismuth; and 98 to 99 per cent. chromium, manganese nickel and aluminum; also Styrian, Vordernberger and Siegerland ores and pig iron, etc. The same company has also been appointed sole agent for the Auto Machinery Company, Ltd., Coventry, England, manufacturer of many series of radial and thrust ball bearings in English and metric dimensions, as well as steel balls up to 4 in. diameter, and brass, gun metal, phosphor bronze and manganese bronze balls up to 2½ in. diameter. The Auto Machinery Company's products are widely used in Great Britain.

The New York office of Lewis F. Shoemaker & Co., builders of steel bridges and buildings, Lewis D. Rights, contracting manager, has been moved from the sixth to the eighth floor of the building at 45 Broadway, New York City.

The Empire Steel & Iron Company has its Oxford, N. J., blast furnace ready for operation after relining and repairing, but it will not be blown in until the coke situation is more clearly developed.

### Analyzing and Testing Fuels for Government Use\*

A large part of the coal used by the United States Government for its power plants, public buildings and naval stations is purchased under contracts that specify the ash and moisture content and the heating value of the coal. The price paid the contractors who supply the coal thus purchased is determined by the analysis of samples taken from deliveries made under each contract. The collection of the samples is done by or under instructions from the Bureau of Mines, and the analysis and testing of these samples constitute an important part of the work of the bureau in determining whether the quality of the coal is up to the fixed standard, and, if it is not, in fixing the reduction in price to be paid in proportion to the lower value of the coal. The samples are collected wherever coal purchased under contract is being delivered to the Government.

In the fiscal year 1910-11 the purchase of coal by the Government under specifications providing for payment according to the quality of coal delivered amounted to approximately 1,091,400 tons, costing, \$3,084,800, notwithstanding the fact that the general plan is to apply this method of purchasing only to contracts of such size as warrant sampling, analysis and heating-value tests.

The specifications applying to the purchase of coal for use on the battleships and naval vessels are different. The mines from which it is proposed to procure coal are visited, samples are taken in the mines, and these samples are analyzed. In making contracts the coal from a mine or mines is specified. On delivery the coal is sampled and tested. These tests show whether the contractor has shipped coal from the specified mine or mines. If the samples of coal as delivered indicate coal inferior in quality to that expected, shipments from the mines specified are no longer accepted. Coal purchased under specifications of this nature and used on naval vessels amounted in round numbers to 750,000 tons in the fiscal year 1910-11.

In the collection of samples a definite scheme of procedure is followed. The number of samples taken from any given delivery of coal is dependent on the size of that delivery, and every practicable precaution is observed to insure that the samples fairly represent the coal delivered. The gross samples taken are reduced by crushing, mixing and quartering to samples that weigh about 2 lb. These are sealed in air-tight containers that are sent by mail to the laboratory of the Bureau of Mines in Washington.

The methods used in the bureau's laboratories are substantially those that were adopted at the Government fuel-testing plant at St. Louis, in 1904, with such modifications and changes as experience has shown advisable, and are believed to embody the essential details of the methods generally recognized as best. During the fiscal year ended June 30, 1911, 8230 samples were received and analyzed by the 10 chemists in the Washington laboratory.

To determine the award of a particular contract or to advise other bureaus and departments of the Government how a particular coal can be utilized to best advantage, or to ascertain what kind of coal can be burned most efficiently in a particular type of furnace, it is necessary for the bureau occasionally to conduct or co-operate in steaming tests of coals. These tests are conducted at the Pittsburgh experiment station, at Government power plants or on board Government ships on which it is proposed to use such coal.

\*From the forthcoming annual report of the Director of the United States Bureau of Mines for the fiscal year ended June 30, 1911.

**Double Back Geared Lathe.**—The Worcester Trade School, Worcester, Mass., is building an 11-in. three-step cone pulley double back geared lathe with positive geared feeds. The high carbon steel spindle is ground and runs in a bronze bearing, the end thrust being taken by a step bolted to the end of the headstock which is entirely independent of the spindle. The tailstock is of the offset type which enables tapers to be turned or compound blocks to be set in a plane parallel with the bed. This lathe is built in a number of different lengths and when equipped with a 5-ft. bed the distance between centers is 34 in., and the weight is 650 lb. The swing over the ways in all sizes is 11¼ in., and that over the compound rest is 8 1/8 in.

### American Brass Founders' Association

Announcement is made by the American Brass Founders' Association, W. M. Corse, secretary, concerning its convention in Buffalo in the week beginning September 23. Headquarters will be at the Hotel Iroquois. The American Foundrymen's Association has selected the Hotel Statler for its headquarters and the Foundry & Machine Exhibition Company, the Lafayette Hotel. The Committee on Papers, of which F. O. Clements of the National Cash Register Company, Dayton, Ohio, is chairman, announces that the following have been secured for the meeting of the brass founders:

"The Electric Furnace for Brass and Bronze, and its Efficiency," by G. H. Clamer, Ajax Metal Company, Philadelphia.

"The Influence of Pouring Temperature on Manganese Bronze," by H. W. Gillett, Aluminum Castings Company, Detroit.

"The Successful Handling of Manganese Bronze and Other Alloys in a Reverberatory Furnace, or Foundry Tests and Foundry Practice," by W. R. Dean, Hyde Windlass Company, Bath, Maine.

"Progress of Work on Boron Suboxide as Used as a Deoxidizer in Non-ferrous Metals," by E. Weintraub, General Electric Company, West Lynn, Mass.

"The Rare Earth Metals with Especial Reference to Pyrophoric Alloys," by Dr. A. Hirsch, New York.

"Phenomena Connected with the Tarnishing of Metals," by Prof. C. F. Burgess, University of Wisconsin, Madison, Wis.

"Vanadium Alloys," by G. L. Norris, Pittsburgh.

"Work of Bureau of Mines as it Relates to the Non-Ferrous Metal Industry," by Prof. C. L. Parsons, Bureau of Mines, Washington, D. C.

"The Practical Use of the Equilibrium Diagram," by Dr. Wm. Campbell, Columbia University, New York.

"The Difficulties Experienced in Casting German Silver," by C. P. Karr, Standard Sanitary Mfg. Company, Louisville, Ky.

### The Laying Out of Automatic Sprinkler Systems

This is a proposition which calls for the most painstaking and highly developed engineering work, based upon careful planning and scientific thought, in order to meet the conditions imposed by the several boards of underwriters, and to get the best possible value out of the plant as installed. It is for this reason that manufacturers of apparatus of this type make every endeavor to put in their own installations rather than to let pipe fitters or outside concerns handle the jobs. It is obvious that an experienced and well-trained engineering corps, which has had years of service in this particular line, will secure for its equipment a higher efficiency than is possible in systems put in by others than experts. It is in the possession of complete facilities for the manufacture of every part of the apparatus, and in an exceptionally well-trained engineering staff that the General Fire Extinguisher Company is extremely strong. Not only this, but the company maintains a large laboratory where all materials, valves, and heads are carefully tested. This combination of engineering skill and manufacturing exactitude has secured for Grinnell equipments the title "standard of the world."

The Chamber of Commerce of Birmingham, Ala., in the "Know Birmingham Movement," visited the plant of the Birmingham Car & Mfg. Company April 23. Following refreshments, the plant was inspected and special attention was given to the manufacture of car wheels and axles from the making of the patterns to the final test as prescribed by the Master Car Builders' Association. The plant can turn out 75 to 100 car wheels per day and is now running to full capacity. The officers of the company who furnished the entertainment are E. Hiller, president; C. E. Faust, vice-president and general manager, and Eugene Fies, secretary.

The Billings & Spencer Company, Hartford, Conn., announces that the selling arrangements formerly existing between it and the Claire L. Barnes Company, Chicago, Ill., have been discontinued by mutual consent. The former company will in the future market its products of forgings and tools direct. During the past two years this company has more than doubled its manufacturing capacity, and the new plant at Dividend, Conn., which is devoted exclusively to the manufacture of heavy forgings, is now in full operation. This, it is stated, enables the company to make unusually prompt deliveries.



## The Chain Lineometer

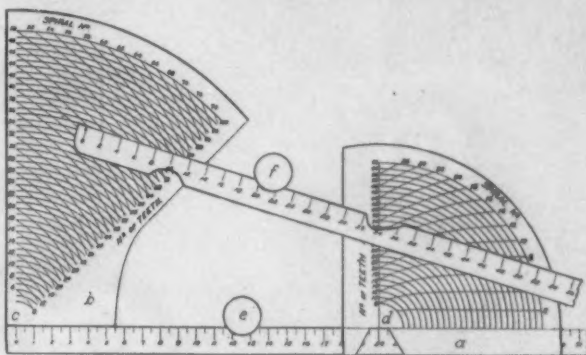
For reducing the time consumed in determining the length of a chain drive when the pitch, the center distance and the number of teeth on the two sprockets are known, the Diamond Chain & Mfg. Company, Indianapolis, Ind., has designed an instrument known as the chain lineometer. With this device instead of having to find the radii of two sprockets from dimension tables and then from formulas finding the angle of the drive and the chain length, the chain lengths can be determined by making three simple adjustments. This device is made in two types, one of paper which is the style illustrated while the other is made of wood and steel.

Referring to the accompanying engraving, the circles on the sectors *a* and *b* are the pitch circles of 1 in. pitch sprockets drawn half size. Points on the different spirals are found by stepping off  $\frac{1}{2}$ -in. chords on each of the pitch circles beginning at the horizontal radius to the left of *c* and to the right of *d*. The fixed scale *e* is laid off in  $\frac{1}{2}$ -in. divisions, each representing a distance equal to the pitch of the chain. On the movable scale *f* each division represents a distance equal to two pitches one for the upper half of the chain and the other for the lower portion. Curves are drawn through the points which are the same number of steps from the horizontal radius. That through the first sets of points is marked No. 2 and that through the point two steps removed is marked No. 4, the numbers of these spirals representing the number of chain links from the point where it crosses a given circle to the corresponding point on the lower half of the circle.

The instrument is employed in this way. Assuming the distance between the sprocket centers be 15 in., the pitch  $\frac{3}{4}$  in. and the number of teeth on the sprockets as 72 and 36 respectively, the center distance is divided by the pitch. The quotient which is the center distance in terms of the pitch is 20 and the sector *a* is set at this figure on the scale *e*. The pitch circles corresponding to 36 and 72 teeth respectively are found on *a* and *b* and the straight edge *f* is placed approximately tangent to these two pitch circles. The point where the spirals cross the pitch circles is noted and the straight edge *f* is shifted so that it covers all but one of these points. In making this change care is to be taken that the zero point on the scale coincides with the uncovered point on the left sector and that the straight edge just touches the corresponding point on the right sector. In this position the straight edge coincides with that of the center line of the chain in passing from one sprocket to the other. The reading of the straight edge is 38 and is twice the number of links in the span of free chain, while the number marked on the spiral passing through the zero point is 44 and that on the spiral passing through the right hand reading is 14. The sum of these three numbers is the chain length in terms of the pitch or 96 and when multiplied by the pitch the product is 72 or the chain length in inches. In general the length of a roller chain must be a multiple of twice the pitch and the reading of the straight edge *e* must therefore be an even number. If the spiral does not pass exactly through one of the even numbered scale divisions the next higher number must be used. If an offset connecting link is used this number must be odd while if the chain is of the block type the reading can be either even or odd since the chain length can be any multiple of the pitch.

This instrument can also be used to determine the center distance so that there will be no slack in the chain and also to determine the length of open and crossed belts. Where a chain has no slack the right sector *a* is shifted until one of the regular divisions of the straight edge is on a spiral. The center distance reading is then multiplied by the pitch in the regular way. When the instrument is to be used for finding the length of belt, a special set of sectors is used. The dial plate *a* is set to the exact center distance and the zero point of the straight edge is set on the pulley circle, the diameter of which is marked on the point should not be on one of the spirals the number of dial plate itself. The straight edge is then placed exactly tangent to the two circles and the exact scale reading from one point of contact to the other is taken. If either the spiral which would pass through the point if it were drawn is to be taken, it being possible to estimate this readily by the eye. If the given center distance or pulley diameter is not found on the instrument, the belt length for half the center distance and half the pulley diameters

can be determined and the results multiplied by two. Where the length of a crossed belt is to be found, the diameter of the left hand pulley is assumed to be equal



The Chain Lineometer, a Device for Determining the Length of Chain Drives Developed by the Diamond Chain & Mfg. Company Indianapolis, Ind.

to the sum of the two diameters and that of the right hand pulley is taken as zero.

In the steel instrument which is not shown adjustments are greatly facilitated. The right hand sector is clamped in position by a thumb screw and the zero point of the straight edge is brought to the proper pitch circle by a slide which is graduated on the left for roller chains and on the right for block and twin roller chains. A set of link work permits the straight edge to swing around the zero point and is open to view.

## The Holophane System of Illumination

The Holophane Company and the Fostoria Glass Specialty Company have been consolidated into one organization, to be known as the Nelite Works of the General Electric Company, with headquarters in Cleveland, Ohio. The factories will remain in Fostoria and Newark for the present. The removal of sales and accounting departments and the change of name took place April 29.

The General Electric Company is stated to have acquired the Holophane property primarily on account of the strength of the patents under which it operates. As has been repeatedly demonstrated, Holophane patents cover broadly the adaptation of certain prismatic forms for use in gas and electric globes and reflectors. Such seeming evasion or actual infringement of these patents as has sprung up within the recent past has continued from lack of rigorous prosecution rather than through any weakness in the Holophane letters patent. Under the new ownership, all patents will be strictly upheld, and the trade will be amply protected against the competition of infringement.

The change will not in any way interrupt the service of either of the constituent companies; on the contrary, the service will be immediately and immensely strengthened. With a staff composed of the most experienced and competent lighting experts; with a fully equipped engineering department of notable ability; and finally with a complete line of products of great variety and high quality, the new organization is prepared to serve the industry in all matters pertaining to the advantageous use of artificial illumination.

The stockholders of the Kelly Reamer Company, Cleveland, Ohio, at their annual meeting held April 20, elected William E. Kelly, W. A. Calhoon, H. J. Maxwell, O. H. P. Davis, E. B. Jessup, George Bauer and Thomas A. Torrance directors, who elected the following officers for the ensuing year: William E. Kelly, president and general manager; W. A. Calhoon, vice-president; H. J. Maxwell, secretary; O. H. P. Davis, treasurer. The company reports a large increase in business in the past year, having experienced an unusual demand for its product.

The forthcoming report of the Indiana state mine inspector, Frank I. Pearce, will show that the coal production in 1911, which was 13,824,723 tons, was 5,300,529 tons less than the production of 1910. There were 20,766 men employed and the wages paid them was \$12,578,668. Of the total coal production, 518,720 tons were block, the bulk of it being bituminous.

## Oxygen Additions to the Furnace Blast

Dr. F. W. Luehrmann, Berlin, reports to the blast furnace committee of the Verein Deutscher Eisenhuettenleute on the effects of adding oxygen to the air blast. Stahl und Eisen presents the information in its issue of April 11. Ordinary air, as driven into the furnace, contains at most 21.77 per cent. oxygen. The problem presented is whether an artificial enrichment in oxygen can be made a commercial success. At the present time this is quite expensive, but if feasible it would be a distinct advantage in pig iron production. The situation may be summed up as follows:

The managements of furnaces in Muelheim-Ruhr, in Ougrée and in Kratzwieck are using small oxygen additions introduced into the blast whenever the furnaces are working cold. They believe that a steady enrichment of this nature would be detrimental to the furnace lining. Dr. Luehrmann, on the other hand, holds that with our advanced knowledge on cooling methods, this danger is not a very real one.

The oxygen added is in the form of "Linde air," or 50 per cent. oxygen and 50 per cent. nitrogen. It is made by evaporating liquid air to a gas with 95 per cent. oxygen, and then further diluting with air to give the above mentioned composition. In the case of blast enrichment, naturally, the liquid air would be evaporated directly into the blast pipe and proportioned to give the higher oxygen percentage desired.

Now as to figures: An installation to furnish 17,500 cu. ft. of oxygen per hour would occupy a space 125 ft. square, and cost about \$100,000, requiring 800 hp. to operate it. This is for Germany. It may be stated that the Linde Company, whose estimate the above figures represent, has so far built installations only up to a capacity of 2,800 cu. ft. of oxygen per hour. There is also a value in the nitrogen recovered. In his article Dr. Luehrmann also gives estimates from rival companies, and next calculates the temperatures attainable through oxygen additions to the blast. He finds that for every 1 per cent. oxygen addition to the blast volume, there is a possible rise in temperature of about 100 deg. F., not taking into consideration the specific heat of gases, etc., or 2830 deg. F. as compared with the theoretical temperature of the CO obtained by burning carbon in air.

Dr. Luehrmann further calculates that this 1 per cent. oxygen addition to the blast volume, in a furnace of 240 tons daily capacity, would add \$2.50 per ton to the cost of the pig iron produced, this being based upon a cost five times as high as that given by interested manufacturers. Should their price be correct—and in time this should be reached by the eventual perfection of the oxygen-making process—the additional cost would drop down to 50 cents a ton of pig iron made, and this cost is well worth while investigating with a view of emergency use when trouble sets in. The furnace manager would feel very much safer if he knew that he had a rapid and reliable method at hand to correct his troubles the moment he noticed them. He would simply have to open a valve and admit sufficient free oxygen into his blast until the furnace was working hot again.

The conclusion is that the idea is worth studying more at length in connection with methods for cheapening the production of free oxygen in large quantities. R. M.

## Programme of the Mechanical Engineers' Meeting

The tentative programme of the spring meeting of the American Society of Mechanical Engineers, which is to be held in Cleveland May 28 to 31, inclusive, is as follows:

Thursday, May 28, will be devoted to the registration, to an informal afternoon reception at the home of Mr. and Mrs. Ambrose Swasey in Cleveland, and a reunion and informal reception at the Chamber of Commerce Hall in the evening.

On Wednesday morning is to be held a short business session, followed by the following papers: "A New Analysis of the Cylinder Performance of Reciprocating Engines," J. Paul Clayton of the University of Illinois Engineering Experiment Station; "Equipment of a Modern Flour Mill on a Gradual Reduction System," John F. Harrison and W. W. Nichols; "Design and Mechanical

Features of the California Gold Dredge," Robert E. Cranston.

Simultaneous with this session is to be one of the Gas Power Section with a number of papers, one of which has been announced: "Problems in Natural Gas Engineering," by Thomas R. Weymouth, chief engineer United Natural Gas Company, Oil City, Pa.

On Wednesday evening, May 29, a lecture on "Sound Waves and How to Photograph Them, and What They Mean," is to be given by Dr. Dayton C. Miller of the Case School of Applied Science, illustrated with apparatus and experiments, and especially with a new instrument, the phonodeik, for projecting sound waves directly upon the screen.

For Thursday morning, May 30, are scheduled the following papers: "New Processes for Chilling Cast Iron," Thomas D. West, the West Steel Casting Company; "Strength of Steel Tubes, Pipes and Cylinders Under Internal Fluid Pressure," Reid T. Stewart, professor of mechanical engineering, University of Pittsburgh; "On the Control of Surges in Water Conduits," W. F. Durand, professor of mechanical engineering, Leland Stanford, Jr., University; "Speed Regulation in Hydroelectric Plants," William F. Uhl.

Friday morning, May 31, the papers announced are as follows: "The Present State of Development of Large Steam Turbines," A. G. Christie, University of Wisconsin; "A Discussion of Certain Thermal Properties of Steam," G. A. Goodenough; "The Reduction in Temperature of Condensing Water Reservoirs Due to Cooling Effect of Air and Evaporation," W. B. Ruggles, Ruggles-Coles Engineering Company, New York; "Results of Tests on the Discharge Capacity of Safety Valves," E. F. Miller of the Massachusetts Institute of Technology, and A. B. Carhart, superintendent, Crosby Steam Gauge & Valve Company, Boston.

Excursions are to be provided for on the afternoon of May 29 to local manufacturing and power plants; there is to be an excursion on Lake Erie on the afternoon of May 30, and a reception and dance at the Colonial Club is scheduled for the evening of May 30. Excursions have also been arranged for the afternoon of May 31 to visit the plants of the Goodrich Rubber Company, the Wellman-Seaver Morgan Company at Akron and the Diamond Match Company at Barberton. Special excursions for ladies have also been arranged.

The executive committee in general charge of the arrangements is as follows: Ambrose Swasey, chairman; R. H. Fernald, vice-chairman; R. B. Sheridan, treasurer; F. W. Ballard, secretary; Worcester R. Warner, G. E. Merryweather, A. G. McKee, E. P. Roberts and S. T. Wellman.

## Government Steel Works in Australia

The question of establishing a state steel plant is still under consideration by the Australian Parliament. The Minister of Labor and Industry recently stated that the development of the iron industry there must be a state enterprise. The commonwealth would soon require \$5,000,000 worth of steel rails. One interest after another had tried to operate the Lithgow Iron Works but without adequate result. The cabinet proposes the establishment of a government steel plant giving the men in control a free hand. The management would probably be vested in three trustees, one an expert from England or America, one a railroad commissioner and the third a good business man.

The Steel Button Mfg. Company, maker of buttons, metal novelties, buckles and fasteners, has moved to its new factory at 473-479 Ketty avenue, and 10-16 Vesper street, Paterson, N. J., where its facilities have been increased in order to serve its customers to better advantage. A sales office has been established at 130 Bleecker street, New York City.

The Missouri Iron Company, St. Louis, Mo., has elected Edward F. Goltra, president; Thomas S. Maffitt, vice-president; J. D. Dana, secretary and treasurer, and P. C. Maffitt, director, with the officers named.



## A National Chamber of Commerce

A national commercial organization to be known as the Chamber of Commerce of the United States was formed at Washington last week, when 750 persons, representing 250 commercial bodies, met in response to an invitation issued by President Taft. Sessions were held on Monday and Tuesday, April 22 and 23. The purpose of the organization will be to establish closer relations between the commercial interests of the country and the Federal administrative officials, and thus to bring about a better understanding and a larger degree of harmony in the application of the laws.

The plan of organization provides that all corporations and organizations not created for a purely commercial purpose shall be eligible for membership in the chamber. Each association having 50 members may have one delegate, and one additional delegate for each additional 100 members, but no organization may have more than 10 delegates. The annual dues shall be \$20 for each delegate. An advisory council of one member from each organization is to be created, and this council will choose a board of directors of 25 members, who shall establish headquarters and install the requisite staff. The convention chose the first board of directors as follows:

George H. Whitcher, Berlin, N. H.; J. H. Fahey, Boston; A. M. Cooper, Bridgeport, Conn.; W. P. Truesdell, New York City; Ludwig Nissen, New York City; H. A. Logan, Pittsburgh; Bernard N. Baker, Baltimore; William D. Mullen, Wilmington, Del.; John Joy Edson, Washington, D. C.; F. F. Prentiss, Cleveland, Ohio; F. A. Bode, Chicago; H. T. Wicks, Saginaw, Mich.; A. H. Vogel, Milwaukee, Wis.; C. G. Craddock, Lynchburg, Va.; P. J. Kruesi, Chattanooga, Tenn.; Lewis W. Parker, Greenville, S. C.; W. B. Thompson, New Orleans; I. H. Kempner, Galveston, Texas; H. J. Hodge, Abilene, Kan.; Elias Michael, St. Louis, Mo.; B. F. Kauffman, Des Moines, Iowa; E. P. Wells, Minneapolis, Minn.; E. G. Griggs, Tacoma, Wash.; A. C. Dickson, Eugene, Ore.; H. H. Allen, San Francisco, Cal.

The directors elected the following officers: President, Harry A. Wheeler, Chicago. Vice-presidents—for the Pacific slope, J. M. Teal, Portland, Ore.; for the South, Asa G. Chandler, Atlanta, Ga.; for the East, A. B. Farquhar, York, Pa.; treasurer, John Joy Edson, Washington, D. C.; counsel, J. Francis Burke, Pittsburgh, Pa.

Permanent headquarters will be established in Washington.

## Trainmen's Wages in Europe and America

In view of the locomotive engineers' wage discussion and Grand Chief Stone's claim that an engineer's pay is not commensurate with the responsibility he has to bear, railroad men are calling attention to a report made by Special Agent Ames of the Interstate Commerce Commission on the average wages paid railroad employees in England. Comparison with the average wages paid to such employees in the United States is as follows:

|                  | England,<br>per day of<br>12 hours | United States,<br>per day of<br>10 hours |
|------------------|------------------------------------|--|
| Engineers .....  | \$1.55                             | \$4.80                                   |
| Firemen .....    | 0.96                               | 2.85                                     |
| Conductors ..... | 1.21                               | 4.11                                     |
| Brakemen .....   | 0.95                               | 2.81                                     |
| Switchmen .....  | 0.94                               | 2.80                                     |
| Trackmen .....   | 0.94                               | 1.32                                     |

On the railroads of Belgium, which are owned by the government, firemen receive \$15.20 to \$22.80 per month, the higher wage only after 15 years' service. Engineers begin at \$22.50 per month, and at the end of 24 years' service work up to \$38 a month. Conductors earn from \$17.97 per month up to a maximum of \$34.70. Brakemen begin as switchmen at 45 cents per day; when promoted they receive \$17.10 per month and work up to \$22 per month. The average railroad worker in Belgium receives 2.22 francs, or 43 cents, a day.

**Reinforced Bearings.**—A reinforced die-cast bearing has been placed on the market by the F. C. Morrison Mfg. Company, 302 Broadway, New York City. This consists of a tinned steel core which adds strength to the bearing and also forms a perfect joint with the surrounding babbitt.

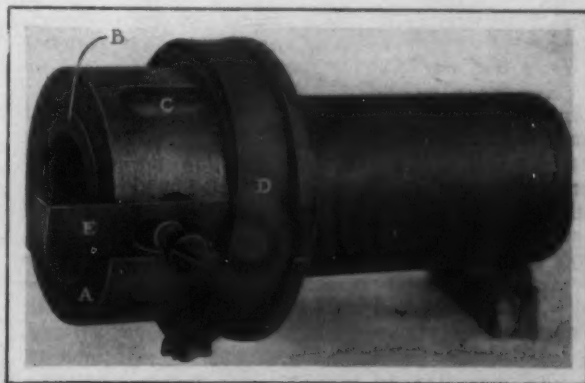
## A Roller Grip Shafting Clutch

In designing the improved type of clutch for shafting here illustrated the Bicknell-Thomas Company, Greenfield, Mass., apparently decided to construct a clutch which would be in a class by itself. Aside from the roller grip on the shaft which is its chief distinguishing point, some of the features of this clutch are a small number of parts, self-adjustment for wear and varying load conditions, the use of a small amount of space, ease of shifting and interchangeable parts.

There are but 16 pieces in the single clutch, including the oil cup, shifter, thimble and collar. It is pointed out that the use of this clutch on the lineshaft and belting directly to the individual machine does away with the use of countershafting and a corresponding saving in space and power is made possible. The amount of space required by this clutch for installation is small, so that it is readily adapted for use in connection with automatic machines, etc.

Inside the body A of the clutch which is free to rotate upon the shaft there is a hardened steel bushing, B, which is keyed to the shaft. A hardened steel cam ring, that is not shown, is mounted loosely on the end of the clutch body. This ring fits into slots in the body and between it and the bushing B are three hardened steel rolls C. A flat coil spring, D, is fastened at one end to the body A and the other end is attached to the cam ring, which is held on the body by a screw and roll which are not shown. On the inner periphery of the cam ring and directly over the rolls C are the cam surfaces which is the radical point of difference between this clutch and the others on the market at the present time.

In operation the clutch is engaged in this way: If the shaft is driving and rotating in a clockwise direction the releasing slide E is pressed into the clutch. The coil



An Improved Type of Clutch for Shafting Having a Roller Grip  
Made by the Bicknell-Thomas Company, Greenfield, Mass.

spring D then causes the cam ring to rotate slightly upon the clutch body A. This action forces the rolls D to move inwardly and become wedged between the driving bushing B and the cam ring. Under the influence of the rolling action between the driving bushing and the rolls the latter press tightly against the cam surface on the inner periphery of the cam ring and the clutch and the shaft then rotate as a single unit.

In tests made these clutches are said to have been very satisfactory. In the manufacturer's factory in one case a 24-in. pulley is mounted on a 1 7-16-in. lineshaft on one of these clutches, the pulley being driven by a 5-hp. motor. Seven medium weight machines are connected to this shaft and all the power required to drive these machines is transmitted through the one clutch. In another case one of the earliest double clutches was fitted to the table reversing mechanism of a grinder running at a speed of approximately 1000 r.p.m. This mechanism has been started and released every few seconds daily during the working hours of the past two years, and it is stated that no attention or repairs have been required.

Three sizes of clutch for shaft diameters of 1 7-16, 1 11-16 and 1 15-16 in. and for lengths of 4, 5 and 6 in. respectively are regularly built, but if desired other clutches for different lengths can be built, as well as for use in connection with larger shafting.

## New Publications

**Scientific Management.** Addresses and Discussions at the Conference on Scientific Management at the Amos Tuck School of Administration and Finance, Dartmouth College, October 12, 13 and 14, 1911. Published by Dartmouth College. Cloth; 387 pages, 9 in. x 6 in. The Weekly Bulletin Publishing Company, 183 Essex street, Boston, Mass., selling agent. Price \$2.50 net.

This volume, which reports the proceedings of the first conference at the Amos Tuck School of Dartmouth College, may be called a compendium up to date on the subject of scientific management. It is a valuable contribution to the literature on the subject, and Dartmouth College deserves praise for its compilation. The introduction to the volume is written by Harlow S. Person, director of the Amos Tuck School. The conference comprised six sessions among which various phases of the subject were apportioned as follows: The Principles of Scientific Management, Scientific Management and Labor, Scientific Management and the Manager, Discussion of the Applicability of Scientific Management in Certain Industries, Scientific Management and Government, and Phases of Scientific Management. During the proceedings addresses were made by men prominent in political life and by well-known manufacturers, educators and engineers, all of which have been reported with the discussions and the symposium which brought the conference to an end. Among the speakers were Dr. Ernest Fox Nichols, president of Dartmouth College; Frederick W. Taylor, Philadelphia; Henry B. Quimby, ex-Governor of New Hampshire; Harrington W. Emerson, New York; Henry L. Gantt, New York; Governor Robert B. Bass, New Hampshire; Dr. Frederick A. Cleveland and others. From the book a very comprehensive idea may be gained of the subject and of some of the criticisms that have been made in connection with it.

**Metal Statistics, 1912.** Fifth annual edition, cloth, 224 pages. Published by the American Metal Market and Daily Iron and Steel Report, 81 Fulton street, New York. Price, 50 cents.

In appearance and general makeup Metal Statistics for 1912, edited by B. E. V. Luty and C. S. J. Trench, is similar to previous editions. The little book is improved, however, in details of arrangement and by the addition of new statistical matter, all so presented that one may turn instantly to figures showing production and comparative prices of ores, refined metals and many products. The new features relate principally to copper, tin, lead and spelter, while iron and steel have been treated with the completeness of previous editions. New copper features are production according to grades, analysis of producers' statistics, fluctuation of world's visible supply, production by Michigan mines and London prices of standard and best selected by months.

**The Elements of Structures.** By George A. Hool, S.B., assistant professor of structural engineering in the University of Wisconsin. Cloth, 188 pages, illustrated. Published by the McGraw-Hill Book Company, 239 West Thirty-ninth street, New York. Price \$1.75.

Prepared in the Extension Division of the University of Wisconsin, this book was designed for use in correspondence study. It deals with the fundamentals of structural engineering in a direct manner, which Professor Hool has made as simple and interesting as possible. The work assumes that the student has had an ordinary training in arithmetic, algebra, plane and solid geometry, logarithms, trigonometry, mechanical drawing and strength of materials and is a prerequisite course to all the regular structural engineering studies offered by the Extension Division of the university. As to design, it treats only of the general methods to be followed. Following the text book idea, the volume contains many definitions and is divided into assignments as well as chapters and other subdivisions.

**Factory Mutual Insurance.** Compiled by the Arkwright Mutual Fire Insurance Company, Boston, Mass. Privately printed and not for sale.

In a well printed and attractively illustrated book of 123 pages, inclosed in board covers, is presented a brief history of the development of factory mutual fire insurance in the last 75 years. The book was compiled in ob-

servation of the fiftieth anniversary of the Arkwright Mutual Fire Insurance Company and is distributed with the compliments of that company to its members, engineers, architects and others interested in fire prevention engineering. In addition to the historical side, attention is given to the progress of fire prevention, on which so much thought has been bestowed of late.

**Brazing and Soldering.** Fifth edition. By James F. Hobart. Paper cover; 51 pages, 5½ in. x 8 in. One of a series of practical papers published by the Norman W. Henley Company, 132 Nassau street, New York. Price 25 cents. Also obtainable from the book department of the David Williams Company, 239 West Thirty-ninth street, New York.

This publication explains in a simple and practical way the processes of brazing and soldering, the equipment required and how it may be devised. It has met with wide favor.

**Knots, Splices and Rope Work.** By A. Hyatt Verrill. Cloth; 102 pages, 5 in. x 7 in. Published by the Norman W. Henley Publishing Company, 132 Nassau street, New York. Price 60 cents.

This book gives simple directions for making useful and ornamental knots of all kinds, also splicing, pointing, serving, etc. Useful to those who handle rope for any purpose.

**House Wiring.** By Thomas W. Poppe, E. E. Flexible cloth cover; 104 pages, 4½ in. x 6½ in. Published by the Norman W. Henley Publishing Company, 132 Nassau street, New York. Price 50 cents.

This is a treatise which describes and illustrates approved methods of installing electric light wiring and is intended for the electrician, helper and apprentice.

The Statistical Abstract of the United States has just been issued by the Bureau of Statistics, Department of Commerce and Labor. Among the general subjects statistically presented in the 800 pages included in the volume are: Area, natural resources and population of the United States; agriculture, forestry, and fisheries; manufacturing and mining industries and patents; occupations, labor, and wages; internal communication and transportation; merchant marine and shipping; foreign commerce; internal commerce; commerce of non-contiguous territory; prices; consumption estimates; money, banking, and insurance; commercial failures; wealth and public finance; civil service; statistical record of the progress of the United States; and the commercial, financial, and monetary statistics of the principal countries of the world. Statistical material for a new and down-to-date edition of the companion volume, the Statistical Abstract of Foreign Countries, is now in course of preparation.

The Standard Iron Company, Ltd., manufacturer of charcoal pig iron at Deseronto, Ont., Canada, having repaired its plant, blew in again April 26 after a shutdown of but a little over two weeks. The machinery required was obtained from local dealers who helped out during this emergency. The repairs at the present time are only temporary in order to enable the company to fill its contracts. General Manager Robert H. Watson, Coristine Building, Montreal, states that the company is building a large charcoal iron furnace at Parry Sound, and as soon as it is in operation he will remodel the furnace at Deseronto and make it a companion plant to that at Parry Sound. This will enable him to produce 7500 tons of charcoal pig iron per month.

The Pittsburgh Steel Foundry Company, 1208 House Building, Pittsburgh, with works at Glassport, Pa., states that having previously owned the majority of the stock of the Pittsburgh Equipment Company, it has acquired the minority interests, and on and after May 1 the business of the Pittsburgh Equipment Company will be conducted under the name of the Pittsburgh Steel Foundry Company, which has assumed all current contracts. The Pittsburgh Steel Foundry Company has increased its capital stock to \$1,000,000 and is enlarging its plant to increase its already extensive facilities for designing and manufacturing the Pittsburgh Equipment Company's complete line of cast steel equipment for freight car bodies and freight car trucks, for which it reports a constantly growing demand.



## The Cummins Metal Schedule

### The Leading Features Outlined by Senator Cummins

An amendment to the metal tariff bill, which is intended as a compromise measure on which the Democrats and low tariff Republicans hope to unite, was introduced in the Senate April 29 by Senator Cummins of Iowa. Senator Cummins explains his substitute as follows:

#### Specific Duties Named

The metal schedule of the Payne-Aldrich tariff law is composed of 82 paragraphs. The proposed amendment rewrites 54 of these paragraphs, making specific changes in the duties. As to 28 of the paragraphs the reduction is horizontal. In a general way the 54 paragraphs which are rewritten comprise what is generally known as tonnage iron and steel, together with lead and zinc. They include the commodities which are usually handled in tonnage quantities. The 28 paragraphs in which the reduction is horizontal cover the more highly organized and manufactured forms of metal, such as cutlery, watches and the like. The specific changes in the 54 paragraphs are founded upon the information obtained in the exhaustive investigations carried on by the Bureau of Corporation, Bureau of the Census and the Immigration Commission.

In so far as has been possible specific duties have been used instead of the ad valorem duties adopted in the schedule passed by the House of Representatives, but in some instances the reductions are greater in the proposed amendment than in the House bill. As illustrations and as a basis of comparison with the House bill the following may be mentioned:

#### Iron Ore Free

Iron ore is made free, as it is in the House bill. In the amendment pig iron pays a duty of \$1 per ton, in the House bill 8 per cent. In the amendment scrap iron is 50 cents per ton, in the House bill 8 per cent. In the amendment billets and the like \$2 per ton, in the House bill 10 per cent. In the amendment steel rails \$2.50 per ton, in the House bill 10 per cent., and as the foreign price of steel rails is about the same as the domestic price \$2.50 per ton is less than 10 per cent. of the foreign price. In the amendment structural iron and steel bear \$3 and \$5 per ton, according to the condition of manufacture. In the House bill all forms bear 15 per cent.; the amendment is much lower than the House bill.

In the amendment bar iron and the like bear a duty of \$3.50 per ton; in the House bill 10 per cent. The amendment is slightly higher than the House bill. On plate iron and steel the amendment bears a duty of \$4 per ton on the cheaper forms and 15 per cent. on the higher priced forms; the House bill is 20 per cent. on all forms.

In the amendment iron and steel sheets bear a duty of \$10 or \$12 per ton, according to thickness; in the House bill 15 per cent.; the amendment is lower than the House bill. In the amendment iron and steel prepared for tinning bear a duty of \$2.25 per ton more than common black sheets, in the House bill 15 per cent. In the amendment tin plate bears a duty of \$16 per ton, in the House bill 20 per cent.; the amendment is lower than the House bill.

The foregoing will show the general reductions that are proposed in comparison with the House bill.

#### Machine Tools Made Dutiable

In the House bill certain articles, such as barb wire, cotton ties, sewing machines, cash registers and machine tools are put upon the free list; in the amendment they are made to bear the same proportionate duties that other articles of like cost are made to bear.

With respect to the 28 paragraphs comprising the more highly organized forms of manufacture the reduction is 20 per cent. The reason that these paragraphs have not been rewritten and the duties readjusted is that there has not been the same investigation with respect to the costs of these articles as has taken place with regard to the cruder forms of iron and steel, and then the author is a

protectionist. He has been careful not to go below the point which will afford ample protection.

With regard to lead and zinc there has been no change made in the duty on lead or zinc contents of ore, but the duty on pig lead and bullion and the like has been reduced from two and one-eighth cents per pound to one and seven-eighths cents per pound, and upon zinc in blocks or pigs, from one and three-eighths cents per pound to one and one-fourth cents per pound.

#### The Valuable Service of a Speedometer

An automobile auditor is what some clever person has called the speedometer and no words could better describe the many practical uses to which this device can be put. The popular impression is that a speedometer is used only for telling speed and distance traveled. While this is very interesting information, which every motorist appreciates, the speed indicator will often prevent the autoist from running faster than he should where traffic regulations make it unwholesome for him to do so. It is surely more economical to purchase a speedometer than to pay a heavy fine. For the practical autoist, however, the man who wants his car to give him all the service he has paid for, the speedometer, in conjunction with its odometer feature, has many other exceedingly useful applications.

First of all, the speedometer will pay its cost by backing claims for rebates on tires which many manufacturers guarantee to cover a certain number of miles. In the event that they do not last the mileage guaranteed, a pro rata allowance is made on the next purchase. Now, can any car owner guess the number of miles the tires have run? The correct method would be to make a memorandum of the date the tire is put in use, also the mileage recorded by the odometer. Then, when the time comes to replace the tire, examine the odometer and note if as many miles have been covered as the guarantee calls for. By the same simple process the odometer will save the autoist considerable money on the gasoline burned, an item that amounts to no inconsiderable figure every month. The filling of tanks is generally left to others and an owner has no means of knowing if he gets the full amount of fuel he is paying for, unless it is checked up now and then with the odometer. The odometer will also audit the engine efficiency by permitting the engine to be kept tuned to a point at which maximum efficiency is secured with a minimum fuel consumption. It should be tested now and then with an odometer, and the owner can make certain that his engine consumes a quantity of gasoline proportionate to the number of miles the car has covered. The same instrument will audit the battery service and help determine which make of battery gives longest service.

Another and more important thing is that when the time comes to purchase a new car to replace the old, it is well to know if that make of car has given the service it should. The odometer will help determine if the user will be justified in purchasing another of the same kind. Joy riding is nearly an impossibility with a car supplied with a speedometer, as the first unauthorized use of the machine will show on the odometer. In touring, particularly in unknown territory, a speedometer-odometer is an absolute necessity. The road maps give the turns as so many miles, or parts of miles. From a given point the odometer tells just when that mileage has been reached, eliminating the fear of turning down a wrong road.

Few realize to what extent speedometers are now used. Many car manufacturers supply them as standard equipment, as part of the car, which means that the speedometers must be manufactured in tremendous quantities. Perhaps one of the largest speedometer factories in the world, if not the largest, is located in Chicago, manufacturing the Stewart speedometer, which occupies four acres of floor space and employs over 500 hands, with an output of over 1500 per day. In this branch of the industry, as well as in other lines, service is an important feature. The Stewart & Clark Mfg. Company, the maker of this device, has 11 branch offices strung across the country in all important cities from Boston to San Francisco.

The Republic Iron & Steel Company, Youngstown, Ohio, is preparing plans for the building of an emergency hospital at its new open-hearth steel plant.

# THE IRON AGE

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W. H. Taylor, President and Treasurer

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Fritz J. Frank, Secretary

M. C. Robbins, General Manager

Editors

Geo. W. Cope A. I. Findley W. W. Macon

Charles S. Baur, Advertising Manager

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## Exports of the Great Iron Countries

Exaggerated statements have lately been made regarding the more rapid growth of German iron and steel exports in the past decade, as compared with the exports of England and the United States. The extreme statement often takes the form of asserting that while in ten years German exports have increased 600 per cent., British and American exports have increased only between 40 and 50 per cent.

In contradiction, the following statement, which as far as it goes is absolutely correct, could be made: Comparing 1901 and 1911, German iron and steel exports increased 282 per cent., British exports 66 per cent. and American exports 203 per cent. This statement would absolutely controvert the one first quoted, for it shows that German exports increased less than half as much as claimed, while American exports increased almost as much as German, and British exports, if they did not increase as much as German exports, at least increased more than 50 per cent.

The fact remains, however, that the statement we give above would be practically as misleading as are the other statements made, referring to the great growth of German exports. There have been such fluctuations from year to year that it makes a great difference which years are taken for comparison. This is readily shown by a couple of examples. Comparing 1900 and 1910, German exports increased 480 per cent.; comparing 1901 and 1911 they increased 282 per cent. These were both ten-year periods. Taking American exports, comparing 1901 and 1911, making a ten-year period, the increase was 203 per cent.; but comparing 1903 with 1911, making only an eight-year period, the increase was 570 per cent., or three times as much in eight years as in ten years. Necessarily, then, comparisons must be made in a broad way, with an adequate supply of statistics.

Iron and Steel Exports from United States, Great Britain and Germany—German Exports in Metric Tons of 2204.6 pounds; Others in Tons of 2240 Pounds.

|            | United States | Great Britain | Germany   |
|------------|---------------|---------------|-----------|
| 1893 ..... | 73,216        | 2,857,743     | 620,123   |
| 1894 ..... | 81,234        | 2,656,125     | 752,830   |
| 1895 ..... | 89,389        | 2,838,149     | 829,813   |
| 1896 ..... | 203,347       | 3,552,286     | 829,510   |
| 1897 ..... | 616,605       | 3,686,106     | 768,176   |
| 1898 ..... | 901,427       | 3,244,350     | 847,534   |
| 1899 ..... | 942,689       | 3,717,606     | 777,181   |
| 1900 ..... | 1,154,284     | 3,540,689     | 838,360   |
| 1901 ..... | 700,857       | 2,812,523     | 1,410,534 |
| 1902 ..... | 372,398       | 3,473,645     | 2,126,803 |
| 1903 ..... | 326,590       | 3,564,601     | 2,199,984 |
| 1904 ..... | 1,167,710     | 3,266,248     | 2,770,886 |
| 1905 ..... | 1,910,255     | 3,721,512     | 3,349,880 |
| 1906 ..... | 1,325,740     | 4,688,846     | 3,666,274 |
| 1907 ..... | 1,301,979     | 5,152,227     | 3,455,899 |
| 1908 ..... | 964,242       | 4,229,508     | 3,735,915 |
| 1909 ..... | 1,243,462     | 4,380,665     | 4,043,730 |
| 1910 ..... | 1,535,698     | 4,735,734     | 4,868,522 |
| 1911 ..... | 2,187,809     | 4,664,772     | 5,377,287 |

In the table above we give the exports of the three countries during the past 19 years. The statistics are not strictly comparable, one country with another, for the reason that some items are included by one country but not by another. This, however, is of minor consequence, the variations not being great. Both England and Germany report the weight of machinery exported, but do not include it in the general statement of iron and steel exports. There are great differences in the degree of finish of the different items exported; but this can hardly be held to affect the comparison between countries, for in the case of the United States its own



figures are not comparable at all, the exports of 10 to 15 years ago being largely pig iron and unfinished steel, while in late years they have been chiefly finished steel.

With the above complete statement before us, it is possible to analyze the situation with confidence. *Ex parte* statements, it will be seen, could readily be made, and would be altogether misleading, as already intimated.

We observe that British exports, while they have been subject to very considerable variations from one year to another, showed a fairly steady increase after 1907. German exports, on the other hand, were practically stationary from 1893 to 1900. They increased considerably in percentage, but the quantities involved were so small that the tonnage increase was negligible. American exports increased from practically nothing to a maximum of over a million tons in 1900, then fell off in three years to a very small amount, thereafter increasing rapidly and almost continuously.

Before making a specific comparison between the countries, it is important to point out the nature of the export movement from the United States. The bare figures do not tell the interesting story which lies back of them. In the early nineties we could not export at all; our costs were too high. With the discovery of the Mesaba iron range, with the great improvement in processes of steel manufacture and with the heavy reduction in wages during the depression of 1893 to 1898 it became possible for us to export partly finished material, as well as rails, which at that time were practically cognate with billets and sheet bars in point of method of manufacture. By 1900, then, we were able to export a large tonnage of pig iron, billets and sheet bars and rails, these three items constituting 55 per cent. of our exports in that year. In 1911 the same items comprised only 35 per cent. of the total. After 1900 the United States Steel Corporation was formed and the practice of dumping these raw or semi-finished products was practically discontinued, exports dropping to a third of a million tons in 1903. Then, with the formation of the United States Steel Products Export Company, began the work of building up an export trade in really finished products, with the result as shown. The movement culminating in the million tons in 1900 was one; the movement from a third of a million tons in 1903 to over two million tons in 1911 was another and entirely distinct movement, occurring under totally different conditions.

If we compare 1900 and 1911 we find American exports fell a trifle short of doubling, while German exports were multiplied by more than six and British exports increased only 32 per cent. Mathematically such a comparison is without fault, but practically it entirely misrepresents the situation, for in the case of American exports the actual things compared are entirely different and the conditions under which they were made were entirely different. Our export trade as we now know it really dates from 1902-3.

Taking a comprehensive and therefore more accurate view of the movement than can be done by comparing simply individual years, it may be said that from 1893 to 1900 British exports increased slightly, and German exports scarcely at all; from 1900 to 1907 both Great Britain and Germany increased with considerable rapidity, but Germany somewhat the more rapidly; from 1907 to 1911 Great Britain not only did not gain, but actually lost, while Germany increased rapidly—56 per cent. in four years.

England was first in the export field by several decades. Germany has made rapid strides since she began, practically only 11 years ago. The United States, in its present movement, began still more recently, only eight years ago, and has really done very well in those eight years, and is closer to Germany now, even though Germany is leading, than ever before, except for that special period 1896-1900 inclusive. Still more close, of course, do we now stand to Great Britain. In 1911 we furnished 18 per cent. of the total tonnage of the three countries; in 1903 our contribution was only 5 per cent.

### Corrugated Sheet Roofing by Weight

The change in the basis of selling corrugated roofing sheets from that of area to weight is one about which there can scarcely be two opinions. The initiative of the largest producer of sheets has been followed by a number of manufacturers, and though no formal action has been taken by the Association of Sheet and Tin Plate Manufacturers, the sheet companies having membership in it are all expected to adopt the new method. Sophistication in the roofing sheet trade has long been admitted, and while not the same odium attached to it as to some other forms of trade dishonesty, there is no hesitation, now that the change is made, in saying that the new departure will work distinctly for the advancement of trade morals.

It is not necessary now, and it would not be profitable, to attempt any distribution of the responsibility for conditions that have existed as between the manufacturer and the jobber, nor to say how far the roofing contractor might have prevented the substitution of a lighter gauge for the one required. A difference of eight or nine pounds on 100 square feet of roofing has not been uncommon, representing at times as much as 10 or 11 per cent. off the correct weight. The return to the honest methods followed in the early days of the use of sheet roofing and siding will in time fix firmly the equivalency, for example, of 85 pounds with 100 square feet of No. 28 galvanized corrugated roofing and the equivalency of 79.6 pounds with 100 square feet of No. 29 gauge material. If light-gauge roofing is specified the responsibility for its shorter life will rest with the consumer or the contractor. But that will be different from putting on sheet roofing the onus of failure to get a 28-gauge life from 29-gauge steel.

### Compulsory English for Foreign Workmen

A little group of manufacturers in a New England manufacturing city are making headway in an effort to compel employees to learn the English language. As in many industries to-day a large percentage of the men and women operatives are from Continental European countries. Many of them are clannish, confining their social existence to contact with people of their own nationalities. They make little effort to become Americanized, even to the extent of acquaintance with the prevailing tongue. The consequence is a somewhat chaotic condition in shops and factories, where very much must depend on those who have immediate supervision of the employees.

Following out a determination that English must be understood and spoken by all employees, these manufacturers posted notices giving their working forces six months in which to acquire this necessary educa-

tion. The task was not wholly easy. The campaign had to be carried beyond the works. The clergy of the city, whose congregations include the men and women in question, were called into the conference. The services of many churches are conducted in foreign tongues, so that their parishioners receive no education in English from this source. Most of the clergy have seen the wisdom of the effort and are assisting so far as is within their power. Night schools were established in the works, stenographers acting as instructors. One of the plants employs a physician who is in frequent contact with every employee. The test of a knowledge of English is largely through him, in the ability of employees to understand his words and to answer him intelligently.

The results thus far are indisputably good. One of the companies operates a textile mill, and in one of its departments a saving of 12 per cent. has already been effected, largely through the reduced quantity of spoiled cloth, which is attributed directly to the better understanding the employees have of the instructions given by printed signs and by word of mouth, for operating and caring for machinery. The non-English speaking operative has to guess a great deal of the time as to what is expected of him.

The general effort is most important. Were the system carried out in a broader way, covering an entire community, its value would multiply many times. A great many foreigners come to the United States with no intention of remaining, their only purpose being to accumulate a certain amount of money and to return with it to their own countries. They have no incentive whatever to learn English; they care nothing for it. Their sojourn here is but a means to an end. If they were compelled to learn the language their contact with people would be much broader. They would feel the enlightening influence of American life and its contrast with that to which they have been accustomed. The chances of their settling down as useful, permanent units in the industrial life of the United States would be much greater. This initial experiment will be followed with close interest, for its results should prove worth striving for by a multitude of employers.

### Studying Machinery in the Home Shop

Manufacturers of some types of machine tools have found it very profitable to maintain a manufacturing department in which their machines are used in producing work for the general trade. The direct financial returns are worth while in themselves, but the most important element is the opportunity given to obtain an intimate knowledge of the machinery in commercial operation. Weaknesses of construction and errors in design are brought to light. Extreme tests may be given the equipment. Operating practice is so improved that a better product is more cheaply manufactured. Expert operators are developed who may be sent out to act as instructors in the works of customers to whom the machines are unfamiliar, or who have met with difficulties in operating them.

Not only has this custom been adopted by builders of grinding machinery, automatics and more or less special machines, but it is being taken up in works which manufacture the standard types. In every case the department is considered a very important one. Very many times the expert knowledge of the home shop enables it to manufacture at a profit-yielding

price, while the cost to the customer is less than would be the case were he to do it himself.

To be truly successful the department should be organized so as to include the elements of a research laboratory. The records of tests and of every-day commercial operations should be carefully compiled. Comparisons should be made with experiences of customers in their use of the machinery. If the records of the machines in other shops are too low, its operatives should be instructed by expert representatives of the builders.

Strange to say, many machine shops do not include in their equipment the latest models of the tools they construct. It is even true that the practice carried on with machinery by its builder is sometimes less efficient than that which he recommends to his customers. This is a great mistake. Every plant should be a demonstration shop for the machinery which it builds. The methods of production should be well ahead of those of its customers. Its experiences should be of such a nature as to be of great value to users of its machinery. The machinery builder should not be dependent for a close study of his product upon what is being done in other plants.

### The Eyesight and Waning Efficiency

A large percentage of the workmen whose efficiency decreases with middle age owe their declining earning powers to their eyes. Most persons experience a change in vision after they pass their 40th birthday, the common trouble being an increasing tendency toward far-sightedness. They find difficulty in reading at a normal distance. The greater focal distance renders it sometimes impossible to see anything clearly, unless nature is assisted by lenses. In not a few manufacturing plants there is an organized inspection of eyes. In the best developed systems the eyes of all employees are examined by a skilled specialist. The more common practice, and an effective one, is to insist upon an examination when a superintendent or foreman finds reason to suspect that something is wrong with the eyes. One evil is that workmen seek the assistance of quack oculists, who frequently do more harm than good. It is not uncommon to see a workman holding a blueprint or a piece of work far from him in order to see it better. Such a condition naturally slows up the man. Clear vision is a large asset, especially where work requiring precision is involved.

### The Pay of Apprentices

The apprentice boy in the machine shop is paid much higher wages than a decade ago. In one large plant which builds machine tools the lad entering upon his course now gets 9 cents an hour as compared with the 4 cents received by his predecessors not many years back. Even with this advance in the earning power of the shop pupil, some owners believe that it is desirable to make the course even more attractive to him financially. In the shops just alluded to the beginner's wage will be advanced to 15 cents an hour.

The wisdom of such a change is urged with force by the manager of this plant. He maintains that he has to pay an unskilled laborer \$1.50 a day as compared with 90 cents given the apprentice, merely because the man has more muscle and more *avoirdupois*. He has no more skill, and in a great many cases less



skill, than the selected boy who is taking a course which will make him a journeyman machinist. In other words, according to this deduction, the apprentice should be paid more instead of less than a man who may not even be sufficiently familiar with the English tongue to comprehend the orders of his foreman.

It is certain that employers must do more toward making the shop attractive for boys. The half time and continuation schools are assisting vitally in conjunction with apprentice systems, but with boys, as well as with men, money usually counts for more than anything else. In shops where the management has become discouraged in the maintenance of apprentice systems, because of the difficulty of securing the right kind of boys and retaining them, the inducement of an increased wage might help to solve the problem.

### United States Steel Corporation's Earnings

Deficit for the March Quarter \$6,292,134

The statement of the United States Steel Corporation's earnings for the quarter ended March 31, 1912, makes the following showing, as compared with the corresponding period of 1911:

|   | 1912         | 1911         |
|---|--------------|--------------|
| January .....   | \$5,243,406  | \$5,869,416  |
| February .....  | 5,427,320    | 7,180,928    |
| March .....   | 7,156,247    | 10,468,859   |
| Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, and interest on bonds and fixed charges of the subsidiary companies..... | \$17,826,973 | \$23,519,203 |
| Less charges and appropriations for the following purposes:   |              |              |
| Sinking funds on bonds of subsidiary companies and depreciation and replacement funds .....   | 4,148,444    | 3,517,386    |
| Sinking funds on U. S. Steel Corporation bonds:   |              |              |
| Installments .....  | 1,012,500    | 1,012,500    |
| Interest on bonds in sinking funds..  | 557,614      | 488,668      |
| Net earnings .....  | \$12,108,415 | \$18,500,649 |
| Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding .....  | 5,741,849    | 5,810,794    |
| Balance .....   | \$6,366,566  | \$12,689,855 |
| Dividends for the quarter:  |              |              |
| Preferred, 1½ per cent.....   | 6,304,919    | 6,304,919    |
| Common, 1¼ per cent.....  | 6,353,781    | 6,353,781    |
| Surplus for the quarter.....  |              | \$31,155     |
| Deficit for the quarter.....  | \$6,292,134  |              |
|   | Tons         | Tons         |
| Unfilled orders on hand, March 31...  | 5,304,841    | 3,447,301    |

The deficit for the quarter is provided from the unfilled surplus at December 31, 1911.

The earnings for the December quarter were \$23,105,115 and the surplus for that quarter was \$89,638.

### Bethlehem Steel Company Bond Issue

An official statement concerning the new financing of the Bethlehem Steel Company says that the company proposes to authorize the issue of \$50,000,000 first lien and refunding 5 per cent. thirty-year gold bonds. A meeting of the stockholders of the Bethlehem Steel Corporation has been called for May 14 to act upon a proposed guaranty by that corporation of the issue, the guaranty to be secured by pledging all the capital stocks of the subsidiary companies of that corporation. Arrangements have been made for the sale to bankers of \$15,200,000 face value of these bonds, the proceeds of which will be used to retire all of the Bethlehem Steel Company five-year 6 per cent. sinking fund secured gold notes now outstanding, to purchase \$2,668,000 of the outstanding \$10,668,000 first extension mortgage 5 per cent. gold bonds of the Bethlehem Steel Company, and to provide that company with additional working capital required by the growth of its business.

William E. Corey has removed his office to 14 Wall street, New York City.

### March Iron and Steel Exports and Imports

The report of the Bureau of Statistics of the Department of Commerce and Labor for March shows a material increase in both the exports and imports of iron and steel as compared with the figures for February. The total value of the exports of iron and steel and manufactures thereof, not including ore, in March was \$24,474,799, against \$21,801,570 in February. The value of similar imports in March was \$2,192,647, against \$1,887,399 in February.

The March exports of commodities for which quantities are given totaled 217,991 gross tons, against 203,666 tons in February. Details of the exports of such commodities for March and for nine months of the current fiscal year ended with March, are as follows, compared with the corresponding periods of the previous fiscal year:

| Commodities                                       | March      |            | Nine months |           |
|---|------------|------------|-------------|-----------|
|   | 1912       | 1911       | 1912        | 1911      |
| Gross tons  | Gross tons | Gross tons | Gross tons  |           |
| Pig iron .....                                    | 19,689     | 15,189     | 100,805     | 126,602   |
| Scrap .....                                       | 6,915      | 40,496     | 57,107      | 33,359    |
| Bar iron .....                                    | 702        | 3,141      | 10,366      | 13,697    |
| Wire rods .....                                   | 7,860      | 2,223      | 29,074      | 13,154    |
| Steel bars .....                                  | 15,539     | 11,746     | 98,364      | 90,851    |
| Billets, ingots and blooms..                      | 23,782     | 32,898     | 150,410     | 118,781   |
| Steel rails .....                                 | 27,332     | 42,520     | 273,033     | 268,075   |
| Iron sheets and plates.....                       | 13,382     | 10,298     | 125,635     | 74,205    |
| Steel sheets and plates.....                      | 26,264     | 20,657     | 190,328     | 140,192   |
| Tin and terne plates.....                         | 6,396      | 5,531      | 31,204      | 16,362    |
| Structural iron and steel...                      | 19,911     | 16,374     | 174,158     | 118,455   |
| Barb wire .....                                   | 6,788      | 6,897      | 77,758      | 60,702    |
| All other wire.....                               | 11,401     | 11,882     | 95,606      | 75,307    |
| Cut nails .....                                   | 825        | 1,306      | 7,984       | 7,678     |
| Wire nail .....                                   | 2,964      | 7,001      | 42,359      | 37,349    |
| All other nails, including tacks .....            | 1,181      | 790        | 9,576       | 8,385     |
| Pipe and fittings.....                            | 26,667     | 17,200     | 189,322     | 126,745   |
| Radiators and cast iron house heating boilers.... | 384        | 217        | 3,361       | 2,901     |
| Totals .....                                      | 217,991    | 216,356    | 1,656,450   | 1,332,800 |

The imports of commodities for which quantities are given totaled 15,968 gross tons in March, against 11,622 tons in February. Details of the imports of such commodities for March and for nine months of the current fiscal year ended with March, are as follows, compared with the corresponding periods of the previous fiscal year:

| Commodities                                   | March      |            | Nine months |         |
|---|------------|------------|-------------|---------|
|   | 1912       | 1911       | 1912        | 1911    |
| Gross tons                                    | Gross tons | Gross tons | Gross tons  |         |
| Pig iron .....                                | 10,154     | 11,578     | 98,237      | 139,092 |
| Scrap .....                                   | 650        | 1,923      | 8,431       | 20,004  |
| Bar iron .....                                | 1,149      | 2,298      | 17,260      | 24,048  |
| Billets, bars and steel plates, n. e. s. .... | 1,502      | 5,041      | 17,611      | 32,344  |
| *Steel rails .....                            | 432        | .....      | 2,621       | .....   |
| Sheets and plates.....                        | 120        | 235        | 1,735       | 3,042   |
| Tin and terne plates.....                     | 106        | 1,157      | 2,562       | 28,128  |
| *Structural iron and steel..                  | 416        | .....      | 2,460       | .....   |
| Wire rods .....                               | 1,039      | 1,302      | 10,922      | 13,977  |
| Totals .....                                  | 15,968     | 23,534     | 151,839     | 290,805 |

\*Included in "all other manufactures of" prior to July 1, 1911.

The imports of iron ore in March were 157,469 gross tons, against 129,693 tons in February and 134,785 tons in March, 1911. The total quantity of iron ore imported in the nine months of the current fiscal year ended with March was 1,451,144, gross tons, against 1,663,970 tons in the corresponding period of the previous fiscal year. Of the imports in March 90,665 tons came from Cuba, 40,561 tons from Sweden, 26,141 tons from Spain and 102 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, excluding ore, in nine months of the current fiscal year ended with March was \$188,517,360, against \$164,881,592 in the corresponding period of the previous fiscal year. The total value of similar imports was, respectively, \$19,551,723 and \$26,249,869.

The Atlanta Steel Company, Atlanta, Ga., will soon add to its power facilities by the installation of a 1600 hp. induction motor in its new rolling mill. The motor is to be of the heavy mill type construction, will be direct connected by gearing and has primary oil switch control and secondary current limit control. This apparatus is being obtained from the General Electric Company.

Eaton, Rhodes & Co., pig iron merchants, Cincinnati, have added a coal department that will be in charge of R. O. Heyser. The firm's offices will be moved to more commodious quarters on the fifth floor of the First National Bank Building.

# The Iron and Metal Markets

## New Prices Maintained Specifications Heavy in All Lines

### Further Rail and Car Orders—Large Sales of Southern Basic—German Syndicate Renewed

Naturally new demand for some forms of finished steel has slackened as prices have advanced. The amount of new business actually placed for bars, plates and structural shapes since April 20 when the \$1 advance became effective is probably less than that which has been offered to the mills since that date at the old prices but not booked. Some consumers did not have faith enough in the old prices to buy before they were withdrawn.

Reports from all markets agree as to the maintenance of the new basis in these three lines and as to the heavy volume of specifications at the prices in effect before the advance. The buying of bars at 1.15c., Pittsburgh, was very large, probably several hundred thousand tons in excess of the previous estimate of 400,000 having been taken by agricultural machinery, wagon and other manufacturers.

With the larger steel companies generally filled up for three months and on some products for four or five months, and with indications that the material bought at low prices in the past six months is entering into consumption without accumulations in second hands, the seller's position is stronger than at any time this year.

A significant fact is that second orders for rails have already come from some lines, and it is evident that other roads failed to cover all their requirements in their original contracts for 1912. The Grand Trunk Pacific has bought 40,000 tons in this country and the Canadian Pacific has just closed with the Steel Corporation for 15,000 tons of 85-lb. open-hearth rails. A Western road has bought about 60,000 tons and the Central of Georgia 3800 tons. The St. Paul has ordered 2000 tons of Mayari steel rails. The South African Railway has placed 8000 tons with the Bethlehem Steel Company. The Frisco system is in the market for 25,000 tons.

Car orders are bearing out recent predictions based on the necessities of various roads. Of the Harriman order awards of 8450 cars are reported, with a contract for 9100 steel underframes. The Atchison order amounted to about 4100 and the Kanawha & Michigan bought 1000. Some of the car companies contracted freely before the advance in plates and shapes, but there is other car business pending for which steel must be bought. The Frisco system is taking bids on 6000 cars.

Semi-finished steel is firmer and in the Central West buyers of sheet bars have been pressing for deliveries on which in some instances large producers have been lagging.

The pig iron situation is uneven. In the Pittsburgh district both steel making and foundry irons are in

little demand, there being but one considerable inquiry for the former. In the South the market has been active, especially in basic iron; one sale this week involved 30,000 tons and another 15,000 tons, the Birmingham basis being now \$11.25. For No. 2 foundry iron \$10.75, Birmingham, is the present minimum, sales for delivery after July 1 being at \$11.

Chicago and Buffalo have had another week of free buying in foundry and malleable irons, and in the former market local irons have advanced 25 cents. Northern sellers in general have not been as firm as their Southern competitors, notwithstanding that Lake ore companies are less inclined to sell at the low opening prices and that coke for the second half is held at a much higher basis than the \$1.55 and \$1.60 contracts that will soon expire.

Pig iron stocks at furnaces have been steadily reduced this year and the total apart from steel companies is probably 1,300,000 tons, as against 2,000,000 to 2,100,000 tons at the beginning of 1911.

Ferromanganese has been advanced by English sellers to \$46, Baltimore. Higher fuel costs and the interference of the Italo-Turkish war with manganese ore deliveries are named among reasons.

Our English cable announces the renewal of the German Stahlwerks Verband for five years, the arrangement applying to what are known as A products—semi-finished steel, structural shapes and rails. It is stated that B products, including wire rods, plates, tubes, castings and forgings, are not covered by the renewal. Under the expiring agreement B products were not sold by the Syndicate, but were taken account of in the tonnage allotments.

## A Comparison of Prices

### Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

|                                      |         | May 1,<br>1912. | Apr. 24,<br>1912. | Apr. 3,<br>1912. | May 13,<br>1911. |
|--------------------------------------|---------|-----------------|-------------------|------------------|------------------|
| <b>Pig Iron, Per Gross Ton:</b>      |         |                 |                   |                  |                  |
| Foundry No. 2 standard, Philadelphia | \$15.10 | \$15.00         | \$15.00           | \$15.00          | \$15.50          |
| Foundry No. 2, Valley furnace        | 13.25   | 13.25           | 13.25             | 13.25            | 13.75            |
| Foundry No. 2, Southern, Cincinnati  | 14.00   | 13.75           | 13.75             | 13.75            | 14.25            |
| Foundry No. 2, Birmingham, Ala.      | 10.75   | 10.50           | 10.50             | 10.50            | 11.00            |
| Foundry No. 2, at furnace, Chicago*  | 14.50   | 14.00           | 14.25             | 14.25            | 15.00            |
| Basic, delivered, eastern Pa.        | 15.25   | 15.00           | 14.50             | 14.50            | 15.00            |
| Basic, Valley furnace                | 13.00   | 13.00           | 13.00             | 13.00            | 13.60            |
| Bessemer, Pittsburgh                 | 15.05   | 15.15           | 15.15             | 15.15            | 15.90            |
| Malleable Bessemer, Chicago          | 14.00   | 14.00           | 14.00             | 14.00            | 15.00            |
| Gray forge, Pittsburgh               | 13.65   | 13.65           | 13.65             | 13.65            | 14.40            |
| Lake Superior charcoal, Chicago      | 15.75   | 15.75           | 15.75             | 15.75            | 17.50            |

|                                      |       |       |       |       |       |
|--------------------------------------|-------|-------|-------|-------|-------|
| <b>Billets, etc., Per Gross Ton:</b> |       |       |       |       |       |
| Bessemer billets, Pittsburgh         | 20.50 | 20.00 | 20.00 | 20.00 | 23.00 |
| Open-hearth billets, Pittsburgh      | 20.00 | 20.00 | 20.00 | 20.00 | 23.00 |
| Forging billets, Pittsburgh          | 27.00 | 27.00 | 26.50 | 26.50 | 28.00 |
| Open hearth billets, Philadelphia    | 23.40 | 22.40 | 22.40 | 22.40 | 25.40 |
| Wire rods, Pittsburgh                | 25.00 | 25.00 | 25.00 | 25.00 | 29.00 |

|                                     |       |       |       |       |  |
|-------------------------------------|-------|-------|-------|-------|--|
| <b>Old Material, Per Gross Ton:</b> |       |       |       |       |  |
| Iron rails, Chicago                 | 16.00 | 16.00 | 15.25 | 14.25 |  |
| Iron rails, Philadelphia            | 16.50 | 16.00 | 15.50 | 16.75 |  |
| Car wheels, Chicago                 | 13.50 | 13.50 | 13.00 | 13.25 |  |
| Car wheels, Philadelphia            | 13.50 | 13.00 | 12.50 | 13.00 |  |
| Heavy steel scrap, Pittsburgh       | 13.25 | 13.25 | 13.00 | 12.50 |  |
| Heavy steel scrap, Chicago          | 11.75 | 11.75 | 11.00 | 11.50 |  |
| Heavy steel scrap, Philadelphia     | 13.50 | 13.25 | 12.50 | 13.00 |  |

\*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.



## Finished Iron and Steel.

|                                   | May 1, 1912. | Apr. 24, 1912. | Apr. 3, 1912. | May 13, 1911. |
|-----------------------------------|--------------|----------------|---------------|---------------|
| Per Pound to Largest Buyers:      | Cents.       | Cents.         | Cents.        | Cents.        |
| Bessemer rails, heavy, at mill..  | 1.25         | 1.25           | 1.25          | 1.25          |
| Iron bars, Philadelphia.....      | 1.30         | 1.27½          | 1.25          | 1.32½         |
| Iron bars, Pittsburgh.....        | 1.25         | 1.25           | 1.25          | 1.32½         |
| Iron bars, Chicago.....           | 1.17½        | 1.15           | 1.15          | 1.25          |
| Steel bars, Pittsburgh.....       | 1.20         | 1.20           | 1.15          | 1.40          |
| Steel bars, tidewater, New York   | 1.36         | 1.36           | 1.31          | 1.56          |
| Tank plates, Pittsburgh.....      | 1.25         | 1.25           | 1.20          | 1.40          |
| Tank plates, tidewater, New York  | 1.41         | 1.41           | 1.31          | 1.56          |
| Beams, Pittsburgh.....            | 1.25         | 1.25           | 1.20          | 1.40          |
| Beams, tidewater, New York....    | 1.36         | 1.36           | 1.31          | 1.56          |
| Angles, Pittsburgh.....           | 1.25         | 1.25           | 1.20          | 1.40          |
| Angles, tidewater, New York....   | 1.36         | 1.36           | 1.31          | 1.56          |
| Skelp, grooved steel, Pittsburgh. | 1.15         | 1.12½          | 1.10          | 1.30          |
| Skelp, sheared steel, Pittsburgh. | 1.20         | 1.17½          | 1.15          | 1.35          |

## Sheets, Nails and Wire.

|                                   | Cents. | Cents. | Cents. | Cents. |
|-----------------------------------|--------|--------|--------|--------|
| Per Pound to Largest Buyers:      |        |        |        |        |
| Sheets, black, No. 28, Pittsburgh | 1.90   | 1.90   | 1.85   | 2.20   |
| Wire nails, Pittsburgh.....       | 1.60   | 1.60   | 1.60   | 1.80   |
| Cut nails, Pittsburgh.....        | 1.55   | 1.55   | 1.55   | 1.60   |
| Fence wire, ann'ed, 0 to 9, P'gh. | 1.40   | 1.40   | 1.40   | 1.60   |
| Barb wire, galv., Pittsburgh....  | 1.90   | 1.90   | 1.90   | 2.10   |

## Coke, Connellsville.

|                                 | Cents. | Cents. | Cents. | Cents. |
|---------------------------------|--------|--------|--------|--------|
| Per Net Ton, at Oven:           |        |        |        |        |
| Furnace coke, prompt shipment.. | \$2.50 | 2.60   | 2.10   | 1.55   |
| Furnace coke, future delivery.. | 2.25   | 2.25   | 2.15   | 1.75   |
| Foundry coke, prompt shipment.  | 2.75   | 2.75   | 2.50   | 1.90   |
| Foundry coke, future delivery.. | 2.65   | 2.65   | 2.50   | 2.15   |

## Metals, Per Pound:

|                                   | Cents. | Cents. | Cents. | Cents. |
|-----------------------------------|--------|--------|--------|--------|
| Lake copper, New York.....        | 16.00  | 16.00  | 16.00  | 12.30  |
| Electrolytic copper, New York..   | 15.87½ | 15.87½ | 16.00  | 12.10  |
| Spelter, St. Louis.....           | 6.75   | 6.85   | 6.60   | 5.30   |
| Spelter, New York.....            | 6.90   | 7.00   | 6.75   | 5.50   |
| Lead, St. Louis.....              | 4.07½  | 4.12½  | 4.12½  | 4.27½  |
| Lead, New York.....               | 4.20   | 4.20   | 4.20   | 4.42½  |
| Tin, New York.....                | 46.37½ | 44.75  | 43.00  | 42.00  |
| Antimony, Hallett, New York....   | 7.62½  | 7.75   | 7.75   | 9.00   |
| Tin plate, 100-lb. box., New York | \$3.54 | \$3.54 | \$3.54 | \$3.94 |

## Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb., New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

**Plates.**—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.25c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wire and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¾ in. thick on edge, or not less than 11 lb. per square ft. take base price. Plates over 72 in. wide ordered less than 11 lb. per square ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

| Extras.   | Cents per lb. |
|---|---------------|
| Gauges under ¼ in. to and including 3-16 in. on thinnest edge           | .10           |
| Gauges under 3-16 in. to and including No. 8.....                       | .15           |
| Gauges under No. 8 to and including No. 9.....                          | .25           |
| Gauges under No. 9 to and including No. 10.....                         | .30           |
| Gauges under No. 10 to and including No. 12.....                        | .40           |
| Sketches (including all straight taper plates) 3 ft. and over in length | .10           |
| Complete circles, 3 ft. in diameter and over.....                       | .20           |
| Boiler and flange steel.....  | .10           |
| "A. B. M. A." and ordinary firebox steel.....                           | .20           |
| Still bottom steel.....   | .30           |
| Marine steel.....   | .40           |
| Locomotive firebox steel.....   | .50           |
| Widths over 100 in. up to 110 in., inclusive.....                       | .05           |
| Widths over 110 in. up to 115 in., inclusive.....                       | .10           |
| Widths over 115 in. up to 120 in., inclusive.....                       | .15           |
| Widths over 120 in. up to 125 in., inclusive.....                       | .25           |
| Widths over 125 in. up to 130 in., inclusive.....                       | .50           |
| Widths over 130 in.....   | 1.00          |
| Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive         | .25           |
| Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive         | .50           |
| Cutting to lengths or diameters under 1 ft.....                         | 1.55          |
| No charge for cutting rectangular plates to lengths 3 ft. and over.     |               |

**Wire Rods and Wire.**—Bessemer, open hearth and chain rods, \$25. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, \$1.40; galvanized, \$1.70. Carload lots to retailers, annealed, \$1.50; galvanized, \$1.80. Galvanized barb wire, to jobbers, \$1.90; painted, \$1.60. Wire nails, to jobbers, \$1.60.

The following table gives the prices to retail mer-

chants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

|            | Fence Wire, per 100 Lb. |        |        |          |        |        |        |        |
|------------|-------------------------|--------|--------|----------|--------|--------|--------|--------|
| Nos.       | 0 to 9                  | 10     | 11     | 12 & 12½ | 13     | 14     | 15     | 16     |
| Annealed   | \$1.55                  | \$1.60 | \$1.65 | \$1.70   | \$1.80 | \$1.90 | \$2.00 | \$2.10 |
| Galvanized | 1.85                    | 1.90   | 1.95   | 2.00     | 2.10   | 2.20   | 2.60   | 2.70   |

**Structural Material.**—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in., on one or both legs, ¼ in. and over, 1.25c. Other shapes and sizes are quoted as follows:

|  | Cents per lb. |
|--|---------------|
| I-beams over 15 in.....  | 1.30 to 1.35  |
| H-Beams over 18 in.....  | 1.30 to 1.35  |
| Angles over 6 in.....  | 1.30 to 1.35  |
| Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909..... | 1.30 to 1.35  |
| Tees, 3 in. and up.....  | 1.30 to 1.35  |
| Zees, 3 in. and up.....  | 1.25 to 1.30  |
| Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909.....                    | 1.30 to 1.35  |
| Deck beams and bulb angles.....  | 1.55 to 1.60  |
| Hand rail tees.....  | 2.10 to 2.25  |
| Checkered and corrugated plates.....   | 2.10 to 2.25  |

**Sheets.**—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows:

|                     | Blue Annealed Sheets |
|---------------------|----------------------|
| Nos. 3 to 8.....    | 1.25 to 1.30         |
| Nos. 9 and 10.....  | 1.35 to 1.40         |
| Nos. 11 and 12..... | 1.40 to 1.45         |
| Nos. 13 and 14..... | 1.45 to 1.50         |
| Nos. 15 and 16..... | 1.55 to 1.60         |

|                         | Box Annealed Sheets, Cold Rolled. |
|-------------------------|-----------------------------------|
| Nos. 10 to 12.....      | 1.55 to 1.60                      |
| Nos. 13 and 14.....     | 1.60 to 1.65                      |
| Nos. 15 and 16.....     | 1.65 to 1.70                      |
| Nos. 17 to 21.....      | 1.70 to 1.75                      |
| Nos. 22, 23 and 24..... | 1.75 to 1.80                      |
| Nos. 25 and 26.....     | 1.80 to 1.85                      |
| No. 27.....             | 1.85 to 1.90                      |
| No. 28.....             | 1.90 to 1.95                      |
| No. 29.....             | 1.95 to 2.00                      |
| No. 30.....             | 2.05 to 2.10                      |

|                         | Galvanized Sheets of Black Sheet Gauge. |
|-------------------------|---|
| Nos. 10 and 11.....     | 1.90 to 2.00                            |
| Nos. 12, 13 and 14..... | 2.00 to 2.10                            |
| Nos. 15 and 16.....     | 2.10 to 2.15                            |
| Nos. 17 to 21.....      | 2.30 to 2.40                            |
| Nos. 22, 23 and 24..... | 2.40 to 2.50                            |
| Nos. 25 and 26.....     | 2.60 to 2.70                            |
| No. 27.....             | 2.75 to 2.85                            |
| No. 28.....             | 2.90 to 3.00                            |
| No. 29.....             | 3.00 to 3.10                            |
| No. 30.....             | 3.20 to 3.30                            |

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice.

## Corrugated Roofing Sheets by Weight

Effective April 18, 1912, the rates for painted and formed roofing sheets, per 100 lb., as announced by the American Sheet & Tin Plate Company, are based on the following extras for painting and forming over prices for corresponding gauges in black and galvanized sheets:

|  | Gauges, per 100 lb. |          |          |          |
|--|---------------------|----------|----------|----------|
|  | 29                  | 25 to 28 | 19 to 24 | 12 to 18 |
| Painting   |                     |          |          |          |
| Regular or oiling.....                             | 0.15                | 0.10     | 0.05     |          |
| Graphite, regular.....                             | 0.25                | 0.15     | 0.10     |          |
| Forming  |                     |          |          |          |
| 2, 2½, 3 and 5 in. corrugated                      | 0.05                | 0.05     | 0.05     | 0.05     |
| V-crimped, without sticks..                        | 0.05                | 0.05     | 0.05     | ...      |
| ¼ to 1¼ in. corrugated.....                        | 0.10                | 0.10     | 0.10     | ...      |
| 3 V-crimped, without sticks..                      | 0.10                | 0.10     | 0.10     | ...      |
| Pressed standing seam, with cleats.....            | 0.15                | 0.15     | ...      | ...      |
| Plain roll roofing, with or without cleats.....    | 0.15                | 0.15     | 0.15     | ...      |
| Plain brick siding.....                            | 0.20                | 0.20     | ...      | ...      |
| 3/15 in. crimped.....                              | 0.20                | 0.20     | ...      | ...      |
| Weatherboard siding.....                           | 0.25                | 0.25     | ...      | ...      |
| Beaded ceiling.....                                | 0.25                | 0.25     | ...      | ...      |
| Rock face brick and stone siding.....              | 0.25                | ...      | ...      | ...      |
| Roll and cap roofing, with caps and cleats.....    | 0.25                | 0.25     | ...      | ...      |
| Roofing valley, 12 in. and wider.....              | 0.25                | 0.25     | ...      | ...      |
| Ridge roll and flashing (plain or corrugated)..... | 0.65                | 0.65     | 0.65     | ...      |

## Corrugated Roofing Sheets, with 2½-In. Corrugations, Per Square.

| Gauge.  | Painted. | Galvanized. | Gauge.  | Painted. | Galvanized. |
|---------|----------|-------------|---------|----------|-------------|
| 29..... |          | \$2.40      | 23..... | \$2.30   | \$3.50      |
| 28..... | \$1.35   | 2.55        | 22..... | 2.50     | 1.80        |
| 27..... | 1.50     | 2.60        | 21..... | 2.70     | 4.05        |
| 26..... | 1.60     | 2.65        | 20..... | 2.90     | 4.35        |
| 25..... | 1.80     | 3.05        | 18..... | 3.90     | 5.70        |
| 24..... | 2.00     | 3.15        | 16..... | 4.70     | 6.50        |

**Wrought Pipe.**—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought

pipe, in effect from December 1, 1911; galvanized iron pipe, from March 1, 1912:

|                      | Steel  |       | Iron   |       |
|----------------------|--------|-------|--------|-------|
|                      | Black. | Galv. | Black. | Galv. |
| 3/4 and 1/4 in.....  | 74     | 54    | 68     | 49    |
| 3/4 in.....          | 75     | 65    | 69     | 53    |
| 1/2 in.....          | 78     | 68    | 72     | 59    |
| 3/4 to 1 1/2 in..... | 81     | 72    | 75     | 64    |
| 2 to 3 in.....       | 82     | 75    | 76     | 65    |

| Lap Weld.               |    |    |    |    |
|-------------------------|----|----|----|----|
| 1 1/4 and 1 1/2 in..... | .. | .. | 68 | 61 |
| 2 in.....               | 79 | 72 | 72 | 63 |
| 2 1/2 to 4 in.....      | 81 | 74 | 74 | 66 |
| 4 1/2 to 6 in.....      | 80 | 72 | 73 | 65 |
| 7 to 12 in.....         | 78 | 68 | 71 | 61 |
| 13 to 15 in.....        | 55 | .. | 47 | .. |

| Butt Weld, extra strong, plain ends, card weight. |    |    |    |    |
|---|----|----|----|----|
| 3/4, 3/4, 3/4 in.....                             | 70 | 60 | 65 | 55 |
| 1/2 in.....                                       | 75 | 69 | 70 | 63 |
| 3/4 to 1 1/2 in.....                              | 79 | 73 | 74 | 65 |
| 2 to 3 in.....                                    | 80 | 74 | 75 | 66 |

| Lap Weld, extra strong, plain ends, card weight. |    |    |    |    |
|--|----|----|----|----|
| 1 1/2 in.....                                    | .. | .. | 66 | 60 |
| 2 in.....  | 76 | 70 | 71 | 63 |
| 2 1/2 to 4 in.....                               | 78 | 72 | 73 | 66 |
| 4 1/2 to 6 in.....                               | 77 | 71 | 72 | 65 |
| 7 to 8 in.....                                   | 70 | 60 | 65 | 55 |
| 7 to 12 in.....                                  | 65 | 55 | 60 | 50 |

| Butt Weld, double extra strong, plain ends, card weight. |    |    |    |    |
|--|----|----|----|----|
| 1/2 in.....  | 65 | 59 | 60 | 52 |
| 3/4 to 1 1/2 in.....                                     | 68 | 62 | 63 | 55 |
| 2 to 3 in.....   | 70 | 64 | 65 | 57 |

| Lap Weld, double extra strong, plain ends, card weight. |    |    |    |    |
|---|----|----|----|----|
| 2 in.....   | 66 | 60 | 61 | 52 |
| 2 1/4 to 4 in.....                                      | 68 | 62 | 63 | 57 |
| 4 1/2 to 6 in.....                                      | 67 | 61 | 62 | 56 |
| 7 to 8 in.....  | 60 | 50 | 55 | 45 |

#### Plugged and Reamed.

|                                  |  |
|----------------------------------|--|
| 1 to 1 1/4, 2 to 3 in. Butt Weld | Will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld as specified. |
| 2, 2 1/4 to 4 in. Lap Weld       |  |

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

**Boiler Tubes.**—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads are as follows:

| Steel.   |        | Standard Charcoal Iron.   |    |
|--|--------|---|----|
| 1 3/4 to 2 1/4 in.....                                     | 65     | 1 1/2 in.....   | 48 |
| 2 1/2 in.....  | 67 1/2 | 1 3/4 to 2 1/2 in.....  | 50 |
| 2 3/4 to 3 1/4 in.....                                     | 72 1/2 | 2 1/2 in.....   | 55 |
| 3 1/2 to 4 in.....   | 75     | 2 3/4 to 5 in.....  | 60 |
| 5 to 6 in.....   | 67 1/2 | Locomotive and steamship special grades bring higher prices.  |    |
| 7 to 13 in.....  | 65     | 2 1/2 in. and smaller, over 18 ft., 10 per cent. net extra.   |    |
| 2 1/2 in. and larger, over 22 ft., 10 per cent. net extra. |        | Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f. o. b. mill at Pittsburgh basing discount, lowered by two points. |    |

## Pittsburgh

PITTSBURGH, PA., May 1, 1912.

Many consumers of finished iron and steel have covered their requirements only to July 1; others up to October 1, while some of the larger interests will buy very little more this year, having bought heavily for delivery up to December 31. It is not remarkable, therefore, that new orders coming in are light. Specifications, however, are pouring in upon the mills, which on some lines are getting further behind in shipments. Most of those in the trade believe that prices will not be any higher in the near future, but that about July 1 bars, plates, shapes and possibly steel sheets and tin plate may be moved up further. The local market on pig iron is only fairly active, new inquiries being mostly for small lots, and while prices are firm they show no signs of advancing. The scarcity in steel billets and sheet bars is getting more acute, and it is said that premiums of 50c. to \$1 a ton are being offered for billets and bars for third quarter delivery. It is still predicted that there will be a more serious shortage in supply of steel before the summer is over. Demand for coke has quieted down and prices are easier. There is only a moderate volume of scrap moving, as dealers are not disposed to accept offers being made by consumers, and are holding their scrap for higher prices. The consumption of steel making scrap in the Pittsburgh and Youngstown districts is heavier than for some months and the available supply on the market is limited.

**Pig Iron.**—Local pig iron markets report inquiries in the market for 12,000 to 15,000 tons, made up mostly

of small lots, one inquiry being for 1500 tons of Bessemer iron for delivery over third quarter. Prices are reasonably firm, but do not show any signs of advancing in the near future. While large sales of pig iron for last half of the year delivery are reported at other centers local consumers have bought very little iron for last half, holding off in the belief that with the low prices on ore they will be able to buy pig iron later at satisfactory prices. Bessemer pig iron is nominally \$14.25, at Valley furnace, but in several actual sales recently \$14.15 has been done, and furnaces are quoting to dealers \$14.25, subject to a concession of 10c. a ton. The Bessemer pig iron market may therefore be quoted at \$14.15 to \$14.25, at Valley furnace. Basic iron is \$13 to \$13.25; malleable Bessemer, \$13 to \$13.25; No. 2 foundry for May and June is \$13.25; for third quarter \$13.50, and gray forge is \$12.75 to \$13, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton. A sale of 1000 tons of gray forge was made at the reported price of \$13, Valley furnace, and 200 tons of Bessemer for prompt shipment at \$14.15, Valley furnace.

**Steel Billets and Sheet Bars.**—The supply of steel seems to be tightening up, and several consumers report they are having trouble in getting deliveries of sheet bars as fast as needed. Within the next year or 18 months there will be a considerable increase in the supply of open hearth steel, since the proposed new plant of the Phillips Sheet & Tin Plate Company at Weirton, W. Va., and the two open hearth plants of the Brier Hill Steel Company and the Youngstown Sheet & Tube Company could turn out 10,000 to 12,000 tons per week. It is claimed that open hearth billets for prompt shipment have sold at \$20.50 and that sheet bars for third quarter are being sold by some makers at \$23 at mill. We quote open hearth billets \$20 to \$20.50; Bessemer billets, \$20.50 to \$21; Bessemer and open hearth sheet bars, \$21 to \$21.50; axle billets, \$25; forging billets for general forging purposes, \$28, all f.o.b. Pittsburgh. We quote Bessemer and open hearth billets \$20 to \$20.50 and Bessemer and open hearth sheet bars \$20.50 to \$21, f.o.b. Youngstown.

**Ferroalloys.**—The explanation given for the present scarcity in supply of ferromanganese is that a great deal of the ore used by English makers comes from Greece, and that the Italo-Greek merchants are refusing to carry out their contracts for ore on account of the Turkish war. This has compelled the English ferromanganese makers to buy ore at higher prices, and they are demanding more money for ferromanganese. A further advance of \$3 a ton has been made in prices of English 80 per cent. ferromanganese, and it is now held at \$46.50, Baltimore. Sales of several carloads for prompt delivery have been made in this territory at \$48 to \$50, delivered. Prices on ferrosilicon are very firm, and sales of several carloads have been made at the full price of \$70, delivered. We quote 50 per cent. in lots up to 100 tons, at \$70; over 100 tons to 600 tons, \$69, and over 600 tons, \$68, Pittsburgh. The lower grades are ruling at about \$20 for 10 per cent.; \$21 for 11 per cent.; \$22 for 12 per cent., f.o.b. cars at furnace, Ashland, Ky., or Jackson, Ohio. We quote 17 per cent. ferrotitanium at 12 1/2 c. per lb. up to 2000 lb.; 10c. per lb. in 2000-lb. lots and over, f.o.b. cars Niagara Falls, N. Y.

**Wire Rods.**—Mills report that new inquiries for wire rods have been better in the past few days, and specifications against contracts are also coming in more freely. In sympathy with other lines of semi-finished steel, prices on rods are firmer now than they have been for some time. We note sales of about 300 tons of open hearth rods on the basis of \$25, Pittsburgh, and we quote Bessemer, open hearth and chain rods at that price.

**Muck Bar.**—The increased operations among the iron bar mills is creating some new demand for muck bar, and we note a sale of 1000 tons of high grade bar made from all pig iron at \$28.50, maker's mill, or \$28.80 delivered to a consumer in the Pittsburgh district. We quote best grades of muck bar at \$28.50 to \$29, Pittsburgh.

**Skelp.**—There is more new inquiry in the market for skelp than for some time, and prices are firmer. A sale of 1000 tons of narrow grooved steel skelp is reported on the basis of about 1.15c., delivered at buyer's mill in the Pittsburgh district.

**Steel Rails.**—No important orders for standard sections were placed with the local interest in the past week, but the Cambria Steel Company reports that it has taken 1500 tons of the recent order placed by the Harriman Lines. The new demand for light rails is a little better and in the past week the Carnegie Steel Company received new orders and specifications for about 2500 tons. We quote splice bars at 1.50c. per lb. and rails as follows: Standard sections, 1.25c. per lb.; 8 and 10-lb. light rails, 1.29 1/2 c.; 12 and 14 lb., 1.20c.; 16



and 20-lb., 1.15c.; 25, 30, 35, 40 and 45-lb., 1.10c., in carload lots, f.o.b., Pittsburgh.

**Structural Material.**—No important new orders were taken by the local interests in the past week, but new inquiry is very active. The Riverside Bridge Company, Wheeling, W. Va., has taken 310 tons for a new steel building for Bloch Brothers, Wheeling. The Norfolk & Western Railroad is taking bids on coal piers at Norfolk, Va., requiring 7000 to 10,000 tons, and the Western Maryland Railroad is in the market for upward of 15,000 tons for bridge work. Nearly all structural fabricators are covered with material for some months ahead at somewhat lower prices than are ruling now. We quote beams and channels up to 15 in. at 1.25c., Pittsburgh, but there is practically no new buying.

**Plates.**—Some large orders for steel cars were placed in the past week and others are in sight. The Harriman Lines have placed contracts for steel underframes and trucks for 9100 cars with the Bettendorf Car & Axle Company, Davenport, Iowa, and has also placed an order with this concern for 300 all-steel gondola cars. The same road is said to have placed 1000 refrigerator cars with the Pullman Company, 600 work cars with the American Car & Foundry Company and 700 stock cars with the Standard Steel Car Company. The Atchison, Topeka & Santa Fe has placed over 4000 cars, of which the Standard Steel Car Company got 1000 box cars, the Pullman Company 500 box and 25 ore cars, the American Car & Foundry Company 1000 box, 250 automobile, 500 furniture and 200 tank, the Western Steel Car Company 500 box and 100 flat, while another concern got 50 dump cars. The Kana-wha & Michigan Railroad has placed 1000 general service cars with the Ralston Steel Car Company, the plates and shapes to be furnished by the Cambria Steel Company, and the latter interest has taken 500 50-ton coke cars for the New England Coal & Coke Company. The Sunset Central Railroad is reported in the market for 1750 freight and 24 passenger cars. General demand for plates is heavy, and specifications against contracts are pouring into the mills at almost an unprecedented rate. One leading local plate mill is filled up to July 1, and with business in sight has very few plates to spare up to October 1. Cambria and Jones & Laughlin steel companies are filled up to July 1 or longer. Prices on plates are firm and we quote  $\frac{3}{4}$  in. and heavier at 1.25c., Pittsburgh.

**Sheets.**—The new demand for sheets is only fairly active, but this is due to the fact that nearly all consumers are covered for several months ahead and specifications are coming in very freely. Shipments this month by the mills will break all previous records and will be somewhat heavier than in March. The American Rolling Mill Company, Middletown, Ohio, and several other sheet mills have adopted the plan of selling roofing sheets by weight instead of area as announced by the American Sheet & Tin Plate Company several weeks ago. Leading sheet mills are running from 85 to 90 per cent. and a few mills are on to full capacity. We quote 1.90c. for No. 28 black sheets and 2.00c. to 2.05c. for No. 28 galvanized in carload and larger lots.

**Tin Plate.**—There has been some increase in new demand for tin plate recently, due to the fact that some consumers have specified for the entire tonnage they had under contracts and have come in the market with new orders. One leading interest placed 50,000 boxes with a local mill in the past week and other smaller orders have been placed. Some in the trade are inclined to believe that there will be a shortage in the supply of tin plate this year, due to the enormous consumption which seems assured. On new inquiries that are coming out the mills are quoting \$3.30 to \$3.40 per base box for 14 x 20 coke plates, and some makers will not shade the higher price.

**Iron and Steel Bars.**—The new demand for both iron and steel bars has quieted down to some extent, due to the fact that consumers are covered up to October 1 and in a good many cases over the remainder of the year. Nearly all the implement makers have bought their entire supply of bars for delivery up to July 1 of next year, and specifications against these contracts are already being received. All the leading mills are holding steel bars firm at 1.20c., but little new business is being placed. The new demand for iron bars is better, and mills report specifications from consumers as coming in more freely than for some time. We quote steel bars on new orders at 1.20c. and common iron bars at 1.25c. to 1.30c., f.o.b., Pittsburgh.

**Hoops and Bands.**—Most leading consumers covered their requirements on hoops and bands and are specifying quite freely against their contracts, and new demand is rather light and confined to small lots. We

quote steel bands at 1.20c., with extras as per the steel bar card, and steel hoops at 1.25c. to 1.30c., the lower price being minimum of the market.

**Rivets.**—The new demand for rivets is more active and makers report that specifications against contracts are coming in quite freely. Shipments this month will be the largest in any one month in the rivet trade for some time. Prices are firm. We quote structural rivets at 1.45c. to 1.50c. and boiler rivets at 1.55c. to 1.60c. in large lots.

**Shafting.**—The new demand for shafting is showing betterment, and specifications are coming in more freely. Makers of shafting believe that prices will show betterment in the very near future. Cold-rolled steel shafting is now being very generally held on the basis of 67 per cent. off in carload and larger lots and 62 per cent. off in small lots delivered in base territory.

**Railroad Spikes.**—New demand is fair and specifications from the railroads are coming in better than for some time. We quote railroad spikes in base sizes at \$1.40 per 100 lb., f.o.b. Pittsburgh.

**Spelter.**—The market has again shown a sharp advance and demand in the past week has been heavy. We quote prime grades of Western at 6.87 $\frac{1}{2}$ c., Pittsburgh, and a sale of 50 tons for May delivery has been made at that price.

**Merchant Steel.**—The new demand is active and shipments this month will show a heavy increase over March. One leading maker reports that its orders sent to the mills for rolling in April were much the heaviest in any one month for more than two years. Prices are very firm and on some grades of spring and tire steel several makers are asking slightly higher prices. We quote: Iron finished tire,  $1\frac{1}{2}$  x  $\frac{3}{4}$  in. and larger, 1.15c.; base; planished tire,  $\frac{1}{4}$  in. and larger, 1.35c.; channel tire,  $\frac{3}{4}$ ,  $\frac{7}{8}$  and 1 in., 1.65c.; toe calk, 1.70c.; base; flat sleigh shoe, 1.25c.; concave or convex, 1.55c.; cutter shoe tapered or bent, 2.15c.; spring steel, 1.75c.; machinery steel, smooth finish, 1.50c., all f.o.b. at mill.

**Wire Products.**—The new demand for wire and wire nails has diminished, as it usually does at this season, and the wire and wire nail markets over the next two or three months will likely be quiet. The spring trade this year has been very disappointing to the mills, the volume of new business being smaller than anticipated. We are advised that regular prices are being well maintained by the mills, but in some cases are being shaded about \$1 a ton by jobbers. We quote wire nails at \$1.60; cut nails, \$1.50; galvanized barb wire, \$1.00; painted, \$1.60; annealed fence wire, \$1.40, and galvanized fence wire, \$1.70, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

**Merchant Pipe.**—No large contracts for line pipe were placed in the past week, but the Philadelphia Company of this city is in the market for 10 miles of 8-in. steel pipe in addition to the contract for about 60 miles which it placed recently. There is also an inquiry in the market for 30 miles of 8-in. steel pipe for shipment to California. Actual orders for tubular goods sent to the mills for rolling in April were the heaviest in any one month in the pipe trade for some time. It is stated that regular discounts are being well maintained.

**Boiler Tubes.**—The new demand for merchant and locomotive tubes is quiet, but railroads are specifying very freely against contracts placed some time ago at somewhat lower prices than are ruling now. Regular discounts on merchant tubes continue to be materially shaded.

**Coke.**—The supply of coke is considerably larger, and as the new demand has quieted down prices have naturally eased off to some extent. A sale is reported of 10,000 tons of standard furnace coke for shipment in May at \$2.50 per net ton at oven. The output of coke last week in the Upper and Lower Connellsville regions was 396,320 tons, a gain over the previous week of 33,031 tons. We quote standard makes of furnace coke at \$2.50 per net ton at oven, but on a firm offer this might be shaded. We quote 72-hr. foundry coke for spot shipment at \$2.75 to \$2.90 per net ton at oven.

**Iron and Steel Scrap.**—Only a moderate amount of scrap is moving from dealers to consumers, as most dealers will not accept offers being made by consumers and are holding for higher prices. Two local steel mills are offering \$13 for heavy steel scrap, but are able to pick up only very small lots at that price, most dealers holding this material at \$13.25 to \$13.50 per gross ton. It is generally believed that higher prices on steel making scrap will rule in the very near future, particularly on low phosphorus melting stock, which has been selling at low figures for some time.

Dealers are quoting as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

|   |            |       |
|---|------------|-------|
| Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery ..... | \$13.25    |       |
| No. 1 foundry cast .....  | \$12.75 to | 13.00 |
| No. 2 foundry cast .....  | 10.75 to   | 11.00 |
| Bundled sheet scrap f.o.b. consumers' mill, Pittsburgh district .....                                     | 11.25 to   | 11.50 |
| Re-rolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa. ....                     | 13.25 to   | 13.50 |
| No. 1 railroad malleable stock .....  | 11.75 to   | 12.00 |
| Grate bars .....  | 9.50 to    | 9.75  |
| Low phosphorus melting stock .....  |            | 15.00 |
| Iron car axles .....  | 21.00 to   | 21.50 |
| Steel car axles .....   | 15.75 to   | 16.00 |
| Locomotive axle .....   | 22.00 to   | 22.50 |
| No. 1 busheling scrap .....   | 11.50 to   | 11.75 |
| No. 2 busheling scrap .....   | 8.00 to    | 8.25  |
| Old car wheels .....  | 13.00 to   | 13.25 |
| *Cast iron borings .....  | 9.75 to    | 10.00 |
| *Machine shop turnings .....  | 10.00 to   | 10.25 |
| †Sheet bar crop ends .....  | 14.00 to   | 14.25 |
| Old iron rails .....  | 14.50 to   | 14.75 |
| No. 1 wrought scrap .....   | 13.00 to   | 13.25 |
| Heavy steel axle turnings .....   | 10.25 to   | 10.50 |
| Stove plate .....   | 9.50 to    | 9.75  |

\*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

†Shipping point.

## Chicago

CHICAGO, ILL., May 1, 1912. (By Telegraph.)

**Pig Iron.**—The exceptionally spirited and heavy buying of pig iron in this market recorded in the past few weeks has been concluded for the most part. There still remain a considerable number of consumers who are not covered for their requirements, and a fairly steady volume of buying continues. Several inquiries for 1000-ton lots are noted, and a large interest making railroad equipment purchased about 6000 tons of basic for its Chicago Heights plant. All the local furnaces have now announced an advance in their prices to the basis of \$14.50, f.o.b. furnace, for No. 2 foundry. This firmer attitude was taken at the close of last week and followed heavy selling by furnaces which have been making minimum prices in this market. The demand for Southern iron has quieted, but the furnace position on the basis of \$11 for No. 2, at Birmingham, appears well established. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

|  |            |         |
|--|------------|---------|
| Lake Superior charcoal .....                           | \$15.75 to | \$16.50 |
| Northern coke foundry No. 1 .....                      |            | 15.00   |
| Northern coke foundry, No. 2 .....                     |            | 14.50   |
| Northern coke foundry, No. 3 .....                     |            | 14.25   |
| Northern Scotch, No. 1 .....                           |            | 16.00   |
| Southern coke, No. 1 foundry and No. 1 soft .....      |            | 15.85   |
| Southern coke, No. 2 foundry and No. 2 soft .....      |            | 15.35   |
| Southern coke, No. 3 .....                             |            | 15.10   |
| Southern coke, No. 4 .....                             |            | 14.35   |
| Southern gray forge .....                              |            | 13.85   |
| Southern mottled .....                                 |            | 13.85   |
| Malleable Bessemer .....                               |            | 14.00   |
| Standard Bessemer .....                                |            | 16.75   |
| Basic .....  |            | 14.75   |
| Jackson County and Kentucky silvery, 6 per cent. ....  |            | 16.90   |
| Jackson County and Kentucky silvery, 8 per cent. ....  |            | 17.90   |
| Jackson County and Kentucky silvery, 10 per cent. .... |            | 18.90   |

(By Mail)

Following two weeks of steel bar contracting by the implement interests, during which time the market situation was such as to result in placing practically all of the expected tonnage within that short period, the general finished steel market occupies an exceedingly strong position, although the general level of prices is still below the average of several years. Following the heavy contracting on the basis of 1.15c., Pittsburgh, for the season's requirements, the price of steel bars is now firm at 1.20c. Plates and structural shapes are also strongly supported at the advanced prices by a continuance of heavy specifications and orders. Railroads are continuing to order rails, making evident that previous contracts were intended to supply only current needs. With the advent of the Inland Steel Company and the Gary Screw & Bolt Company as makers of bolts and rivets in this territory Chicago becomes a basing point for these commodities. The local scrap market continues to show strength and some advances despite the large tonnage recently offered by the railroads.

**Rails and Track Supplies.**—It is becoming more apparent that the earlier contracting by the railroads for rails was not intended to provide for their year's requirements, and already four of the prominent Western roads have placed second orders with local mills. An estimate has been made that over 500,000 tons of rails are now scheduled for rolling in this district. The Chicago, Milwaukee & St. Paul placed an order for 2000 tons with a seaboard steel company. A number of inquiries for street railroad trackage is noted. Quotations for railroad spikes range from 1.50c., as a minimum for desir-

able orders, to 1.65c. One interest makes its minimum 1.55c. We quote standard railroad spikes at 1.50c. to 1.60c., base; track bolts with square nuts, 1.95c., base, all in carload lots, Chicago; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.20c. to 1.25c.; 16 to 20 lb., 1.25c. to 1.30c.; 12 lb., 1.30c. to 1.35c.; 8 lb., 1.35c. to 1.40c.; angle bars, 1.50c., Chicago.

**Structural Material.**—The local situation as regards fabricated material continues considerably demoralized and few contracts are being taken at prices which admit of any profit. Butler Brothers' new warehouse, the award on which is expected this week, will require 8,000 to 10,000 tons of steel. Contracts reported for the past week aggregate about 5000 tons, of which the most important is 2074 tons for the new Marshall Field Estate Building, awarded to the Morava Construction Company. The American Bridge Company will furnish 115 tons for the Kansas City Southern Railway and 427 tons for transmission towers for the Utah Light & Railway Company, Salt Lake City. The Chicago, Milwaukee & St. Paul Railroad awarded 829 tons of bridge work to the Fort Pitt Bridge Company. The Noelke-Richards Iron Works will fabricate 376 tons for the Mercantile Building, St. Louis. Contracts were also let for 556 tons of trusses and cylinder piers for the St. Louis, Peoria & Northwestern Railway Company at Pekin, Ill., and for 496 tons of bridge work to the Midland Bridge Company. Because of the secrecy observed both by the railroads and the car builders an accurate reckoning of new car orders is difficult. The volume of structural specifications for car building is such as to point unmistakably to the buying of a very large number of cars. The Santa Fé has awarded 3250 to the Pullman Company, the American Car & Foundry Company and the Standard Steel Car Company. Still pending is the inquiry of the Harriman Lines for a number of cars, variously estimated from 8200 to 10,000. It is reported that 600 of these cars have already been purchased. The Wabash and the Burlington systems are in the market for 1000 each and the Canadian Pacific is understood to be in the market for 4000, in addition to the 3000 already purchased. We quote for plain shapes, Chicago delivery, mill shipment, 1.43c., and from store 1.65c.

**Plates.**—A somewhat disgruntled attitude upon the part of plate users who failed to cover for their requirements when prices were lower indicates a degree of firmness on the part of makers in maintaining the new schedules. It is generally conceded, however, that regular users have covered for their needs for an extended period in advance. Specifications continue heavy and orders at the mills are accumulating rather than diminishing. We quote for Chicago delivery, mill shipment, 1.43c. and from store 1.65c.

**Sheets.**—Sheet tonnage continues persistently heavy although irregularities in quotations under the advanced schedule of prices are more or less frequent. Store prices for blue annealed sheets have been advanced \$1 a ton. We have revised our prices and quote Chicago delivery as follows: Carload lots, from mill, No. 28 black sheets, 2.08c. to 2.13c.; No. 28 galvanized, 3.13c. to 3.18c.; No. 10 blue annealed, 1.58c. to 1.63c. Prices from store are No. 10, 1.95c.; No. 12, 2c.; No. 28 black, 2.30c., and No. 28 galvanized, 3.45c.

**Bars.**—Contracting for steel bars by the implement interests has been almost entirely completed, and the fact that buyers considered the market situation such as to warrant prompt covering for their requirements is an indication of the recognized strength of the market at the price uniformly made. At the advance of \$1 a ton to the basis of 1.38c., Chicago, little business has been placed. The volume of bar iron tonnage continues to show improvement and the major portion of the business placed has brought prices above 1.15c. We quote as follows: Bar iron, 1.17½c. to 1.25c.; hard steel bars, 1.20c. to 1.25c.; soft steel bars, 1.38c., and from store, soft steel bars 1.50c. to 1.55c., Chicago.

**Rivets.**—It is expected that the new plant of the Gary Screw & Bolt Company at Gary, Ind., will be completed and placed in operation not later than June 1. With the advent of this new mill and the addition of a bolt and rivet plant by the Inland Steel Company, Chicago takes an important place in the market for rivets. We quote structural rivets, ½ in. and larger, 1.68c. base, Chicago, in carload lots.

**Old Material.**—While advances in scrap quotations have not been so numerous the past week, the strength of the market continues undiminished. This position has been maintained despite heavy offerings of scrap by the railroads, all of which have brought good prices. A continued advance in market quotations has brought prices to a point very close to that at which country dealers who have been holding their stock for two and



three years will be inclined to unload. Steel scrap, particularly shoveling steel, a tonnage of which is being shipped to Gary, is in better demand than foundry grades of scrap. The demand for shoveling steel, which has been persistent in this market for several weeks, has been accompanied apparently by a parallel demand for No. 1 busheling. On some grades of mill scrap, such as machine shop turnings, prices are perhaps not quite as firm as a week ago. The Chicago, Milwaukee & St. Paul Railroad is offering 2100 tons of scrap of which the principal item is 500 tons of rerolling rails, and the Chicago, Rock Island & Pacific has a list of 3000 tons of which the largest single item is 500 tons of No. 1 wrought. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

| Per Gross Ton.  |                    |
|---|--------------------|
| Old iron rails .....  | \$16.00 to \$16.50 |
| Old steel rails, rerolling .....                              | 13.25 to 13.75     |
| Old steel rails, less than 3 ft. ....                         | 12.25 to 12.75     |
| Relaying rails, standard section, subject to inspection ..... | 24.00              |
| Old car wheels .....  | 13.50 to 14.00     |
| Heavy melting steel scrap .....                               | 11.75 to 12.25     |
| Frogs, switches and guards, cut apart .....                   | 11.75 to 12.25     |
| Shoveling steel .....   | 11.50 to 12.00     |
| Steel axle turnings .....                                     | 9.50 to 10.00      |

| Per Net Ton.                                 |                    |
|--|--------------------|
| Iron angles and splice bars .....            | \$13.75 to \$14.25 |
| Iron arch bars and transoms .....            | 15.00 to 15.50     |
| Steel angle bars .....                       | 11.25 to 11.75     |
| Iron car axles .....                         | 19.25 to 19.75     |
| Steel car axles .....                        | 15.75 to 16.25     |
| No. 1 railroad wrought .....                 | 12.50 to 13.00     |
| No. 2 railroad wrought .....                 | 11.50 to 12.00     |
| Steel knuckles and couplers .....            | 11.00 to 11.50     |
| Steel springs .....                          | 11.25 to 11.75     |
| Locomotive tires, smooth .....               | 13.00 to 13.50     |
| Machine shop turnings .....                  | 7.25 to 7.75       |
| Cast and mixed borings .....                 | 6.75 to 7.00       |
| No. 1 busheling .....                        | 10.25 to 10.75     |
| No. 2 busheling .....                        | 7.50 to 7.75       |
| No. 1 boilers, cut to sheets and rings ..... | 8.00 to 8.25       |
| Boiler punchings .....                       | 13.00 to 13.50     |
| No. 1 cast scrap .....                       | 12.00 to 12.50     |
| Stove plate and light cast scrap .....       | 10.25 to 10.75     |
| Railroad malleable .....                     | 11.50 to 12.00     |
| Agricultural malleable .....                 | 10.25 to 10.75     |
| Pipes and flues .....                        | 9.25 to 9.50       |

**Cast Iron Pipe.**—In addition to the inquiries mentioned a week ago as pending, the city of Cleveland expects to award contract for 3000 tons May 6. At Grand Rapids, the United States Cast Iron Pipe & Foundry Company was the low bidder for 600 tons. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$27; 6 to 12 in., \$25; 16 in. and up, \$24.50, with \$1 extra for gas pipe.

**Wire Products.**—Shipments of wire products in the month of March were slightly ahead of those in the same month a year ago. Wire nails in particular were in good demand, while barb wire and fencing have been moving as freely as can be expected in view of the tardy spring. We continue to quote as follows: Plain wire, No. 9 and coarser, base, \$1.58; wire nails, \$1.78; painted barb wire, \$1.78 to \$1.83; galvanized, \$2.08; polished staples, \$1.83; galvanized, \$2.13, all Chicago.

## Philadelphia

PHILADELPHIA, PA., April 30, 1912.

Notwithstanding the generally higher level of prices the volume of business in all products continues comparatively steady. The bulk of the sales have been in small and moderate lots, with some contracting for requirements extending into the third quarter, but most sellers continue indisposed to sell for extended shipment. Heavy plate mills continue to receive a good volume of orders at the new price basis, but some makers of plain shapes still accept business at 1.35c., delivered. Billets are in more active demand, with prices up about \$1 a ton. Iron bars, while quiet, are firm at 1.30c. minimum. A moderate movement in foundry pig iron is noted. Asking prices of steel making grades are higher. Basic has been quiet, but low phosphorus iron has been more active. The old material market is stronger, with prices slightly higher on small lots. Coke has a weaker tendency. Prices of 80 per cent. ferromanganese have again been advanced, \$46, Baltimore, now being quoted for last half delivery.

**Iron Ore.**—No fresh inquiries have developed and business under negotiation moves with extreme slowness. Importations during the week include 4000 tons of Cuban and 10,544 tons of Swedish ore.

**Pig Iron.**—While current business in the higher standard grades of foundry iron has usually been restricted to small lots the aggregate sold has been comparatively large. In the majority of instances slightly higher prices have been obtained. Sellers' positions

have been steadily improving, most makers in this district being now pretty fully sold up for second quarter and not disposed to enter business for third quarter at figures prevailing for prompt deliveries. Considerable inquiry for third quarter, as well as for earlier shipment, is before the trade. Stove makers in the Schuylkill Valley will probably make purchases aggregating several thousand tons. Local stove foundries, while not direct inquirers, are prepared to make purchases for third quarter if their views as to prices, which are considerably below the current market, are met. The recently prevailing price of \$15 for standard brands of eastern Pennsylvania No. 2 X foundry has practically disappeared, but much depends on the customer and delivery. The general run of the market is closer to \$15.10 to \$15.35, delivered, and in instances even higher prices are obtained. Moderate sales of Virginia foundry iron are reported at \$13, furnace, for No. 2 X and \$12.75 for No. 2 plain. Several Virginia makers are now practically sold up for second quarter. Third quarter sales of Southern No. 2 foundry in moderate quantities are reported to melters in this district at \$11, Birmingham. This grade for second quarter appears scarce at \$10.75. Cast iron pipe makers are still actively inquiring for low grade iron. One sale of 1500 tons of Northern low grade at \$14.50, Delaware River delivery, is reported and the same seller is now holding firmly to \$14.75 for a further sale. Sales have been made of off irons to pipe makers at \$14.50, delivered. Low grade iron in this district, as well as in Virginia and in the South, is quite scarce and prices are steadily hardening. Some little movement in rolling mill forge iron is noted; this grade is strong at \$14.50 to \$14.75, delivered. While there has been no further movement in basic iron some negotiation is pending. Apparently the quotation of \$15 for this grade has disappeared, makers holding at \$15.25 to \$15.50, delivered, according to date of shipment. Low phosphorus iron has been more active; sales aggregating 5000 tons of standard analysis iron for third quarter shipment at close to \$19.50, delivered here, are reported, and makers are holding fourth quarter iron at \$20. For delivery in buyers' yards in this district the following range of quotations for second quarter and occasionally for shipment into the third quarter is named, makers generally refusing to sell for more extended shipment except at advanced prices:

|  |                    |
|--|--------------------|
| Eastern Pennsylvania No. 2 X foundry ..... | \$15.10 to \$15.35 |
| Eastern Pennsylvania No. 2 plain .....     | 14.85 to 15.10     |
| Virginia No. 2 X foundry .....             | 15.75 to 16.00     |
| Virginia No. 2 plain .....                 | 15.50 to 15.75     |
| Gray forge .....                           | 14.50 to 14.75     |
| Basic .....                                | 15.25 to 15.50     |
| Standard low phosphorus .....              | 19.50 to 19.75     |

**Ferroalloys.**—Prices of 80 per cent. ferromanganese have been advanced to \$46, Baltimore, for second half delivery. No business has been put through at the new basis; in fact, little was closed at the old \$43.50 price by consumers in this district, although heavy sales in the West are reported. Prompt ferromanganese is extremely scarce and premiums could be had if a supply were available. Very little movement in ferrosilicon, either 50 per cent. or the lower grades, is reported.

**Billets.**—A sharp increase in the demand for both rolling and forging billets for prompt as well as forward delivery is noted. Asking prices are generally higher and old quotations are being gradually withdrawn. Mills are operating close to capacity and deliveries are somewhat harder. Some few contracts for forward delivery were entered prior to the advance, although in instances, particularly for forging billets for Western shipment, slightly better prices were obtained. For reasonably early delivery in this district basic open-hearth rolling billets are quoted at \$23.40 to \$24.40, with forging billets at \$28.40 to \$29.40, according to specification.

**Plates.**—The recent advance in prices has been well maintained and considerable business in moderate lots has been put through at the new level. Orders and specifications have been in excess of the normal productive rate of some mills, and prompt shipments are not so readily obtainable. Some transactions in ship plates, involving a considerable quantity, have been quietly closed by Eastern mills, the details of which are lacking. Consumers are still endeavoring to place contracts for extended delivery, but most mills refuse to consider such business at current quotations, which for prompt delivery in buyers' yards in this district range from 1.40c. to 1.45c. for ordinary plates.

**Structural Material.**—The demand still shows irregularity and while some mills are quoting 1.40c. minimum for plain shapes, others will accept business at 1.35c., delivered, mill activities not yet being up to

what might be considered as a satisfactory basis. Fabrication contracting shows little improvement, the bulk of the business being in small unimportant lots. A new 21-story hotel project at Thirteenth and Chestnut streets is again being talked of, several attempts previously made to finance such a project having failed. Fabrication prices show no improvement, indicating that fabricators are protected against the recent price advances.

**Sheets.**—A moderate demand continues. Deliveries were delayed last week by the idleness of the Conshohocken mills, owing to labor difficulties, which have been adjusted, an advance in wages being granted. As a result of this idleness some accumulation of orders is noted and mills resumed this week at full capacity. Fair sales of Western sheets are reported at unchanged prices, quotations ranging from 2.05c. to 2.10c. for No. 28 gauge, delivered here, although Eastern mills making smooth, loose-rolled sheets easily obtain an advance of  $\frac{1}{4}$ c. to  $\frac{1}{2}$ c. per pound.

**Bars.**—Notwithstanding the rather quiet demand for ordinary iron bars makers have made a slight advance in prices, holding with comparative firmness at 1.30c. to 1.35c., delivered, at which basis some moderate business has been closed. Steel bar specifications are reported good, but little new business is being placed at the new basis of 1.35c., delivered here.

**Coke.**—Some uncertainty surrounds the situation and consumers generally are waiting until the market becomes more settled. A lower range of prices is expected; in fact, some recessions from the recent extremely high levels are reported. Prompt coke is not quite so scarce and spot furnace coke is quoted around \$2.30 to \$2.40 at oven, with contracts at \$2.20 to \$2.40. Foundry coke for prompt shipment is quoted at \$2.40 to \$2.60, while for contracts \$2.25 can be done. Stock coke is quoted at \$1.60 to \$1.70 at oven. The following range of prices, per net ton, delivered in buyers' yards in this district is quoted:

|                                 |                  |
|---------------------------------|------------------|
| Connellsville furnace coke..... | \$4.50 to \$5.00 |
| Connellsville foundry coke..... | 4.75 to 5.25     |
| Mountain furnace coke.....      | 4.10 to 4.60     |
| Mountain foundry coke.....      | 4.35 to 4.85     |

**Old Material.**—The strength of the market has been maintained and advances are noted on small sales of various grades. Some mills refuse to pay quoted prices for heavy melting steel scrap, but such mills are usually well supplied with stock. Sales of small lots of No. 1 heavy melting steel have been made at \$13.50, delivered, while it is reported that \$14 has been paid for a round lot. As high as \$16 has been paid for small lots of No. 1 railroad wrought. Old car wheels have been in demand and better prices have been realized. Wrought turnings have been more freely sold, but cast borings are quiet. Considerable material will be offered on the month's railroad lists and it is predicted that higher prices will be realized. The following range of prices about represents the market for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate varying from 35c. to \$1.35 per gross ton:

|  |                    |
|--|--------------------|
| No. 1 heavy melting steel scrap and crops..... | \$13.50 to \$14.00 |
| Old steel rails, rerolling (nominal).....      | 14.50 to 15.00     |
| Low phosphorus heavy melting steel scrap.....  | 16.25 to 16.75     |
| Old steel axles.....                           | 17.00 to 17.50     |
| Old iron axles (nominal).....                  | 23.00 to 23.50     |
| Old iron rails (nominal).....                  | 16.50 to 17.00     |
| Old car wheels.....                            | 13.50 to 14.00     |
| No. 1 railroad wrought.....                    | 15.75 to 16.25     |
| Wrought iron pipe.....                         | 12.50 to 13.00     |
| No. 1 forge fire.....                          | 11.75 to 12.25     |
| No. 2 light iron (nominal).....                | 7.00 to 7.50       |
| Wrought turnings.....                          | 10.75 to 11.25     |
| Cast borings.....                              | 9.75 to 10.25      |
| Machinery cast.....                            | 13.75 to 14.25     |
| Railroad malleable (nominal).....              | 12.00 to 12.50     |
| Grate bars, railroad.....                      | 10.50 to 11.00     |
| Stove plate.....                               | 10.50 to 11.00     |

In the financial difficulties of Emanuel Dreifus & Co. it is stated that the bankruptcy proceedings instituted in New York have been temporarily vacated to enable the creditors to form a satisfactory plan for the liquidation of the embarrassed concern. The present plans involve the transfer of the business for liquidation to two trustees. This plan, it is said, has met with the approval of the creditors' committee and also the members of the Dreifus firm and is now being presented to the creditors for their approval.

The Republic Iron & Steel Company's three Pioneer furnaces at Thomas, Ala., produced 902 tons of pig iron on Monday, April 29, the output of the No. 1 furnace being 334 tons. The output for April was not far from a daily average of 900 tons.

## Cleveland

CLEVELAND, OHIO, April 30, 1912.

**Iron Ore.**—A general start in the movement of ore boats will be made to-morrow and by the end of the week it is expected that nearly all of the bulk freighters will be in commission. Orders were issued yesterday to the captains of the steamers of the Pittsburgh Steamship Company to sail as soon as they are ready. The barges of the Pittsburgh fleet will sail Saturday. Boats of several other shippers started yesterday. The first ore cargo of the season shipped to a Lake Erie port reached Toledo from Escanaba April 25 and the first cargo from Duluth was shipped yesterday. Several consumers are in a hurry to get ore. The ore movement will be heavy from the start, and it is probable that May shipment will break former records for that month. The Pittsburgh Steamship Company yesterday placed contracts with independent vessel managers for moving a large volume of ore at the rates recently established. These contracts are said to aggregate between 7,000,000 and 8,000,000 tons. Most of the ore shippers have now contracted for about all the vessel tonnage they will require. Contracts for carrying ore placed with independent boats are said to aggregate between 15,000,000 and 16,000,000 tons. The ore unloading charge at Lake Erie ports will be definitely fixed within a day or two at 10c. a ton or under. Dock shipments have been quite heavy this month, and it is expected that there will be fully 1,000,000 tons of ore less on the docks May 1 than on the corresponding date a year ago. Some ore was sold during the week and other sales are pending, but the market generally is rather quiet. The sales during the remainder of the season will be limited largely to small lots. We quote ore prices as follows: Old range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; old range non-Bessemer, \$3.05; Mesaba non-Bessemer, \$2.85.

**Pig Iron.**—The demand for foundry iron in this territory has improved. The smaller consumers, many of whom have been holding off, now are coming into the market for their last half requirements. They apparently feel that prices for that delivery will get no lower and may become higher. Considerable iron was sold during the week. There is fairly active inquiries for lots of 500 tons and under. A local stove manufacturer, who bought 2000 tons of No. 2 foundry about two weeks ago, has just made another purchase of a similar tonnage. We also note the sale of a 1000-ton lot to a Cleveland consumer. A local sales agency has sold the leading sanitary interest 1500 tons of No. 2 Southern at \$11, Birmingham, for its Louisville plant, and about 3000 tons of Southern charcoal iron in lots of 300 to 1000 tons for delivery in the Pittsburgh district during the remainder of the year. A nearby stove foundry has purchased 2000 tons of Ohio silvery iron. There is an inquiry from the Wheeling, W. Va., sanitary interest for 900 to 1200 tons of No. 2 Southern for the last half delivery. Prices are firm at \$13.25, Valley furnace, for No. 2 foundry. A local interest which has been making lower quotations for outside shipment has advanced its price to from \$12.90 to \$13, Cleveland, for No. 2 foundry. Some Southern furnaces have advanced their asking prices for No. 2 to \$11.50, Birmingham. We quote the following prices for prompt shipment and for the last half, delivered Cleveland:

|   |                  |
|---|------------------|
| Bessemer.....                             | \$14.15          |
| Basic.....                                | 13.75            |
| Northern No. 2 foundry.....               | \$13.25 to 13.50 |
| Southern No. 2 foundry.....               | 15.10 to 15.35   |
| Gray forge.....                           | 12.50 to 12.75   |
| Jackson silvery, 8 per cent. silicon..... | 17.30 to 17.55   |

**Coke.**—The market is inactive. Furnace coke for prompt shipment is quoted at \$2.50 to \$2.75 per net ton at oven. A local interest is holding for former price for contracts. Foundry coke is firm at recent prices. We quote 72-hr. foundry coke at \$2.75 to \$3 per net ton.

**Finished Iron and Steel.**—Following the heavy buying before the recent advance in prices to 1.20c. on steel bars and 1.25c. on plates and structural material the market is quiet. Some current orders, mostly in less than carload lots, are coming out, but they do not involve enough to thoroughly test the new prices. The market appears to be very firm, sales of steel bars, structural material and in most cases, plates, being made at the new quotations. In some cases an advance of \$1 a ton is being asked from occasional buyers for less than carload lots of bars and for prompt shipment orders. The larger producers are holding firmly to 1.25c. on plates, but some mills making a narrow range of sizes are still quoting 1.20c. Consumers specified very heavily in March on 1.10c. steel-bar contracts that expired April 1, and it will be a few weeks



before all of this low priced material is used up. As a result specifications are as yet light on 1.15c. contracts that were made prior to April 20. Buyers are well covered with contracts at the latter price, so that no large business will be booked at the 1.20c. price for some time. The demand for structural material is more active. The Canton Bridge Company has taken a contract for 1000 tons for a new building for the Berger Mfg. Company, Canton, and the Forest City Steel & Iron Company, Cleveland, has taken 500 tons for a building for the Cleveland Hardware Company. Bids were received April 29 for 2500 tons for the Second National Bank Building, Toledo. The Goodyear Tire & Rubber Company, Akron, is in the market for 1500 tons for warehouses in Detroit, New York and Boston. A new building for the Cleveland Foundry Company will require 1000 tons. There is an inquiry from Detroit for 2000 tons of plates and shapes. A lake boat to be built by the Collingwood Shipbuilding Company, Collingwood, Ont., will require about 4000 tons of plates and shapes. The O'Rourke Engineering Construction Company, New York, was low bidder on concrete foundations for piers for a new bridge in Cleveland. These piers will require 150 tons of re-enforcing bars. There is little new demand for sheets, as most consumers are under contract. Some of the mills are selling sheets at 1.00c. for No. 28 black and 2.95c. for No. 28 galvanized for spot shipment but are adhering to the regular quotations of \$1 a ton higher for contracts. Some makers of forging billets have advanced their prices \$1 a ton to \$28 Youngstown or \$29 Cleveland, for delivery in this market. The demand for iron bars is very light. The quotation is unchanged at 1.20c. Cleveland mills.

**Old Material.**—While the market is not active, more scrap is moving than for some time. Local dealers are still selling heavy steel for shipment to Sharon, where they are getting \$13, which nets them more than local mills are willing to pay. The scarcity of old car wheels has resulted in an advance of \$1 a ton in the local market. Quotations on railroad malleable and busheling have advanced 50c. a ton. Bids on railroad lists will be received May 1 by the Erie, Wheeling & Lake Erie and the Pennsylvania Railroads. Dealers prices, f.o.b., Cleveland, are as follows:

| Per Gross Ton.                       |                    |
|--------------------------------------|--------------------|
| Old steel rails, rerolling.....      | \$12.75 to \$13.00 |
| Old iron rails.....                  | 14.00 to 14.50     |
| Steel car axles.....                 | 17.50 to 18.00     |
| Heavy melting steel.....             | 11.75 to 12.00     |
| Old car wheels.....                  | 13.00 to 13.50     |
| Relaying rails, 50 lb. and over..... | 22.50 to 23.50     |
| Agricultural malleable.....          | 10.50 to 11.00     |
| Railroad malleable.....              | 12.00 to 12.50     |
| Light bundled sheet scrap.....       | 9.50 to 10.00      |

| Per Net Ton.                               |                    |
|--|--------------------|
| Iron car axles.....                        | \$18.50 to \$19.00 |
| Cast borings.....                          | 7.00               |
| Iron and steel turnings and drillings..... | 7.25 to 7.50       |
| Steel axle turnings.....                   | 7.75 to 8.00       |
| No. 1 busheling.....                       | 10.00 to 10.25     |
| No. 1 railroad wrought.....                | 11.00 to 11.25     |
| No. 1 cast.....                            | 11.25 to 11.75     |
| Stove plate.....                           | 9.00 to 9.25       |
| Bundled tin scrap.....                     | 11.00 to 11.50     |

## Cincinnati

CINCINNATI, OHIO, May 1, 1912. (By Telegraph.)

**Pig Iron.**—Southern prices are firmer, although the volume of business transacted in this territory has shown no appreciable increase in the past few days. The minimum prompt shipment quotation on No. 2 foundry is \$10.75, Birmingham, although it is probable that a few small lots of speculative iron might be obtained slightly below this figure. For shipment after July 1, \$11 is strictly adhered to by all producing interests. Recent sales at this price include 1500 tons of No. 2 soft to a nearby melter and 500 tons to a Michigan manufacturer. A central Ohio firm also purchased a fair sized lot and there are numerous orders booked for carload to 100-ton quantities scattered throughout Ohio and Indiana. Northern iron is not quite so steady as Southern, but, so far as known, the Hanging Rock district furnaces have not sold below \$13.50, Ironton, and they are booking business for delivery through the year at this price. About 2500 tons of different grades of foundry iron were taken by a central Ohio consumer for last half shipment and 1500 tons of Northern malleable was booked for an Indiana manufacturer. Contrary to the usual rule, malleable is not maintaining its usual premium of 25c. a ton over No. 2 foundry and is quoted at \$13.50, Ironton. Southern charcoal is more active and several contracts have been made lately for shipment to Central Western manufacturers on the basis of \$22.50, Birmingham,

for July-December movement. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

|  |                    |
|--|--------------------|
| Southern coke, No. 1 foundry and 1 soft..... | \$14.50 to \$14.75 |
| Southern coke, No. 2 foundry and 2 soft..... | 14.00 to 14.25     |
| Southern coke, No. 3 foundry.....            | 13.50 to 13.75     |
| Southern coke, No. 4 foundry.....            | 13.25 to 13.50     |
| Southern gray forge.....                     | 13.25 to 13.50     |
| Ohio silvery, 8 per cent. silicon.....       | 16.70 to 17.20     |
| Lake Superior coke No. 1.....                | 14.95              |
| Lake Superior coke No. 2.....                | 14.70              |
| Lake Superior coke No. 3.....                | 14.45              |
| Basic, Northern.....                         | 14.70              |
| Standard Southern car wheel.....             | 25.25 to 25.50     |
| Lake Superior car wheel.....                 | 19.00              |

(By Mail)

**Coke.**—For last half shipment a consumer in this territory contracted for about 15,000 tons of furnace coke at a figure only slightly below regular market quotations. This coke will come from the Pocahontas field. Quite a number of furnace coke contracts will expire July 1, but furnace men show much hesitancy in placing orders at prevailing prices. In all three fields standard 48-hr. brands are quoted around \$2.35 to \$2.50, figures much in excess of those made last year at this time. Foundry grades, for either prompt or deferred shipment, are bringing all the way from \$2.70 to \$3, although little new business is being done. The Connelville district continues to report a shortage of labor and there are also complaints from several sections of the scarcity of cars.

**Finished Material.**—The recent advances are being strictly adhered to in this market and 1.20c., Pittsburgh, for steel bars and 1.25c. for shapes and plates are minimum quotations. Most of the larger users covered before the advance was made and there is little new business, although shipments on contracts are moving at a very satisfactory rate. Local warehouses quote 1.60c. for steel bars and 1.70c. for structural material. Sheets are moving fairly well and manufacturers and jobbers are holding firmly to present quotations.

**Old Material.**—A little better buying movement is reported. The local foundries are melting more scrap, and there is also an improvement in the demand from other sources. Prices are firm and unchanged. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations the selling prices f.o.b. at yards:

| Per Gross Ton.                     |                  |
|------------------------------------|------------------|
| Bundled sheet scrap.....           | \$8.50 to \$9.00 |
| Old iron rails.....                | 12.75 to 13.25   |
| Relaying rails, 50 lb. and up..... | 20.00 to 21.00   |
| Rerolling steel rails.....         | 11.00 to 11.50   |
| Melting steel rails.....           | 10.00 to 10.50   |
| Heavy melting steel scrap.....     | 10.00 to 10.50   |
| Old car wheels.....                | 11.50 to 12.00   |

| Per Net Ton.                          |                    |
|---------------------------------------|--------------------|
| No. 1 railroad wrought.....           | \$10.00 to \$11.00 |
| Cast borings.....                     | 6.00 to 6.50       |
| Steel turnings.....                   | 6.25 to 6.75       |
| No. 1 cast scrap.....                 | 10.50 to 11.00     |
| Burnt scrap.....                      | 7.50 to 8.00       |
| Old iron axles.....                   | 16.00 to 16.50     |
| Locomotive tires (smooth inside)..... | 11.75 to 12.25     |
| Pipes and flues.....                  | 7.00 to 7.50       |
| Malleable scrap.....                  | 8.50 to 9.00       |
| Railroad tank and sheet scrap.....    | 6.50 to 7.00       |

## San Francisco

SAN FRANCISCO, CAL., April 23, 1912.

The Pacific coast market remains fairly active, with further improvement in some departments, both in inquiries and actual bookings. Aside from a large pipe order, and a few important bar inquiries, most individual sales are still rather small, but the outlook for large orders is more encouraging. The upward tendency of Eastern prices has brought out a little new business, but the attitude of the coast trade toward the recent advances is still doubtful, as many buyers are not convinced that they can be maintained. There is accordingly no tendency toward speculative buying.

**Bars.**—Bids on local harbor construction, which will require 2000 tons or more of reinforcement, will be received in a few days, and other important inquiries are pretty well assured for the near future, while small orders for reinforcing bars continue numerous. Local mills have their current output fairly well cleaned up, and there is a much better feeling as to prices. Some of the larger buyers of soft steel bars are also coming into the market, and merchants' specifications are coming out freely in view of an active distributive trade, though no heavy tonnage is being purchased for stock. The Benicia, Cal., Arsenal will open bids May 15 for

its bar requirements of the next fiscal year. Bids will be taken May 1 by A. S. Dawson, Vancouver, B. C., for work requiring about 600 tons of reinforcing steel. Open-hearth reinforcing bars, San Francisco, are quoted at 1.95c. Jobbing prices on soft steel bars from store, San Francisco, are 2.25c; iron, 2.15c.

**Structural Material.**—Notwithstanding the number of important buildings in prospect, recent bookings are limited almost entirely to small apartment house jobs. Such work is hardly sufficient to keep the local fabricators occupied, and all inquiries are subject to close competition. The largest contract recently let was on the Crocker Estate building, about 250 tons, taken by the United States Steel Products Company, and a contract for the Hind Estate building on Sixth street, about 125 tons, was placed with the Pacific Rolling Mill Company. Bids will be taken May 1 for a small job on the municipal garbage incinerator, and considerable structural steel will be required for the harbor work now figuring, though the latter job is not considered very attractive. Los Angeles is taking bids on 100 I-beam reinforcing sets, details of which are not known here. The United States Steel Products Company is low bidder on an addition to the capitol at Salem, Ore. The B. P. O. E. at Seattle, Wash., expects to start work on a large building in July, plans for which are about ready for figures, and a 6-story steel frame building is to be erected by the Knights of Pythias at Vancouver, B. C. Plans will soon be ready for a large hotel at O'Farrell and Mason streets, this city. Plans are under way for 10 Class A school jobs in Oakland, but the work is temporarily held up by an injunction. New figures will be taken on the Y. M. C. A. building at San Jose, Cal., about 100 tons. All other work recently mentioned as in prospect is still delayed.

**Rails.**—Local prices on light rails are higher in sympathy with Eastern markets. Both light and standard sections are quiet, and aside from a few rather uncertain projects there is not much inquiry from such concerns as place their orders locally.

**Sheets.**—The riveted pipe trade continues to buy on a large scale, taking a considerably heavier tonnage than usual at this season. Merchants also report a very active movement of galvanized and blue annealed sheets in the small trade.

**Plates.**—The jobbing trade continues to drag, small buyers showing very little interest. A number of large projects requiring tank steel are under way, however, and a heavy movement is expected within the next month. About the largest inquiry now in the market is from the Esperanza Oil Company, this city. The Pacific Power & Light Company, Walla Walla, Wash., is taking figures on a gas plant, to cost about \$30,000, and preliminary plans are under way for gas plants at Healdsburg and Madera, Cal.

**Merchant Pipe.**—Aside from the large order placed by the General Pipe Line Company with the National Tube Company, nothing of importance is coming from the oil fields, but a few waterworks inquiries are expected. The city of Vancouver, B. C., will open bids May 15 for 2000 ft. of 18-in. lap weld pipe. Local merchants are still buying freely for current needs, the activity in small, consuming trades being well maintained.

**Cast-Iron Pipe.**—The tonnage actually booked is still rather light, only a few small orders being reported, but local agents are optimistic for the future. Local prices have advanced \$1 per ton in sympathy with primary markets. The town of San Luis Obispo, Cal., will take bids on a small tonnage May 6, and the town of Oxnard will soon be out for a considerable tonnage. Bay City, Ore. is planning to build a new water system this summer, and business is expected soon on several gas projects. Of the local fire protective system, 30 miles of pipe are laid and ready for operation.

**Pig Iron.**—The increasing firmness of Southern iron is bringing out a little more inquiry from the local trade, but with considerable foreign material held in warehouses, and quiet conditions in the foundry trade, no heavy movement is anticipated. Foundry operations are gradually increasing, however, and a short period of activity would cause a strong market. No. 2 Southern foundry iron is quoted here at \$21.

**Old Material.**—Increasing strength is noted in steel melting scrap. Several large accumulations have been sold for shipment to Philadelphia, and more inquiries have been received both from there and from Italy. Local dealers are inclined to hold for a further advance. Cast-iron scrap is also receiving more attention, several melters being in the market for fairly large lots, and prices are higher. There is little movement of wrought scrap, and rerolling rails are well taken up

by existing contracts. The Geary street tracklaying contract, just let, involves the removal of a large lot of reinforcement from the old cable conduit. Prices are quoted as follows: Cast-iron scrap, per net ton, \$15 to \$15.50; steel melting scrap, per gross ton, \$11.50 to \$12; wrought scrap, per net ton, \$12.50 to \$15; rerolling rails, per net ton, \$11.

Harry Silberman, head of the San Francisco Iron & Metal Company, is now in Philadelphia.

## Boston

BOSTON, MASS., April 30, 1912.

**Old Material.**—Somewhat contrary to expectations here prices have again advanced, notably on heavy melting steel, skeleton, wrought iron pipe and turnings. The condition is largely speculative, however, and even higher prices than those quoted are mentioned. Dealers are more hopeful than a week ago as to the permanency of the improved conditions. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

|                                   |                    |
|-----------------------------------|--------------------|
| Heavy melting steel .....         | \$10.25 to \$10.75 |
| Low phosphorus steel .....        | 11.45 to 11.95     |
| Old steel axles .....             | 14.00 to 14.50     |
| Old iron axles .....              | 17.00 to 18.00     |
| Mixed shafting .....              | 13.00 to 13.50     |
| No. 1 wrought and soft steel..... | 10.00 to 10.50     |
| Skeleton (bundled) .....          | 8.25 to 8.75       |
| Wrought iron pipe .....           | 9.25 to 9.75       |
| Cotton ties .....                 | 7.75 to 8.25       |
| No. 2 light .....                 | 4.50 to 5.00       |
| Wrought turnings .....            | 7.25 to 7.75       |
| Cast borings .....                | 6.25 to 6.75       |
| Machinery, cast .....             | 12.50 to 13.00     |
| Malleable .....                   | 8.75 to 9.25       |
| Grate bars .....                  | 6.00 to 6.50       |
| Stove plate .....                 | 8.00 to 8.50       |
| Cast iron car wheels .....        | 11.75 to 12.00     |

## Birmingham

BIRMINGHAM, ALA., April 29, 1912.

**Pig Iron.**—It appears this week that a little more conservatism is being displayed in pig iron buying. In other words, the danger of advancing the market too rapidly has evidently been carefully considered and it is thought here that for a few weeks a much quieter movement may be experienced so far as actual booking of orders is concerned. At the same time producers are not overlooking the fact that finished products are continuing to show a great deal of activity. Some fair sales of pig iron were made last week and practically everything thus sold went on the books at the \$11 schedule. No one has thus far been able to secure delivery running into next year, and some interests are very firm at \$11.50, Birmingham, for fourth quarter. The strongest point about the entire situation appears to be that the melt of the country at large is now exceeding the producing rate. So far as the Birmingham district is concerned it appears unlikely that there will be any change in the rate of production for several months, though it is reported that several furnaces now idle will be overhauled and put in shape to start on short notice. The market remains very firm on the following schedule, per ton of 2240 lb., f.o.b. Birmingham district furnaces:

|                                   |                  |
|-----------------------------------|------------------|
| No. 1 foundry and No. 1 soft..... | \$11.50          |
| No. 2 foundry and No. 2 soft..... | 11.00            |
| No. 3 foundry .....               | 10.50            |
| No. 4 foundry .....               | 10.00            |
| Gray forge .....                  | 9.75             |
| Basic .....                       | 10.50            |
| Charcoal iron .....               | \$22.00 to 22.50 |

**Cast Iron Pipe.**—The Alabama pipe makers seem to be very busy, and there is a generally better feeling prevailing. It now seems likely that the high rate of production will continue without interruption through the current year. It is a fact that an unusually large number of big orders are on the books. There is, consequently, not the slightest disposition to shade prices in any direction on any kind of tonnages that are offered. Prices are, if anything, a little higher, but can be continued on the following schedule, per net ton, f.o.b. cars foundries: 4 to 6 in., \$23; 8 to 12 in., \$22.50; over 12 in., average, \$21.50.

**Old Material.**—Dealers are more optimistic this week than they have been in some years. It now looks as if a better chance prevails of a higher market at no distant



date. Prices continue, f.o.b. dealers' yards, Birmingham, as follows:

|                                 |                    |
|---------------------------------|--------------------|
| Old iron axles (light).....     | \$12.50 to \$13.00 |
| Old steel axles (light).....    | 11.50 to 12.00     |
| Old iron rails.....             | 11.50 to 12.00     |
| No. 1 railroad wrought.....     | 10.50 to 11.00     |
| No. 2 railroad wrought.....     | 9.00 to 9.50       |
| No. 1 country wrought.....      | 6.00 to 6.50       |
| No. 2 country wrought.....      | 5.50 to 6.00       |
| No. 1 machinery.....            | 8.50 to 9.00       |
| No. 1 steel.....                | 8.00 to 8.50       |
| Tram car wheels.....            | 7.50 to 8.00       |
| Standard car wheels.....        | 9.50 to 10.00      |
| Light cast and stove plate..... | 6.00 to 6.50       |

**Coal and Coke.**—The advance in miners' wages for cutting coal becomes effective May 1 and this has tended to make Alabama operators a little stronger in their quotations than they would ordinarily be at this season. The coke market is very firm, with slightly higher prices being quoted. Good foundry grades are still to be had, however, at \$3.25 to \$3.75 per net ton, f.o.b. Alabama ovens.

## Buffalo

BUFFALO, N. Y., April 30, 1912.

**Pig Iron.**—The past week has shown a continuance of the active demand and heavy buying which have characterized the market for three or four weeks. Buffalo district furnaces have taken about 45,000 tons of foundry, malleable and forge iron and about 12,000 tons of basic, including Canadian business, with about 15,000 to 20,000 tons of various grades still under negotiation, and large sales of malleable have been made to a wide field of distribution in New England, New York and Pennsylvania. These sales include considerable tonnages for foundries supplying railroad trade. Car builders are showing more interest in both malleable and charcoal iron, as well as in foundry grades. Furnaces are reaching more closely sold-up conditions for the last half and prices exhibit increasing strength. One furnace interest announces a minimum of \$14.50 for No. 1 foundry; \$14 for No. 2 X, and \$13.75 for No. 2 plain and No. 3. Another furnace interest states that \$14 is its minimum on all grades, and the following schedule represents the market as accurately as possible for current and third quarter and last half delivery f. o. b. Buffalo:

|  |                    |
|--|--------------------|
| No. 1 X foundry.....                           | \$14.00 to \$14.50 |
| No. 2 X foundry.....                           | 13.50 to 14.00     |
| No. 2 plain.....                               | 13.50 to 14.00     |
| No. 3 foundry.....                             | 13.50 to 13.75     |
| Gray forge.....                                | 13.25 to 13.50     |
| Malleable.....                                 | 14.00 to 14.25     |
| Basic.....                                     | 14.00 to 14.50     |
| Charcoal, according to brand and analysis..... | 15.75 to 17.00     |

**Finished Iron and Steel.**—The outlook in all the principal lines of finished products is exceedingly bright, the indications being that new business and specifications on contracts already placed will keep the steel mills in full operation for the next 4 or 5 months. Immediate delivery from mill stock for small orders is commanding a premium. The demand for plates, shapes and bars continues active and prices are holding the advance which went into effect April 20. Specifications on contracts from the smaller agricultural implement makers are now coming in and it is expected that the larger consumers will soon commence to specify. Spikes are firm at 1.40c for carloads and 1.45c for smaller lots. In fabricated structural material the market continues to exhibit satisfactory features. A large amount of business is developing and prices show betterment. The Buffalo Structural Steel Company has received contract for fabricating and erecting the steel for the Francis H. Root Estate's commercial building on Chippewa street, Buffalo, 700 tons. The same company has received contract for the fabrication and erection of 330 tons of steel for the cattle building on the State Fair grounds at Syracuse. The Lackawanna Bridge Company has been awarded contract for the fabrication and erection of steel for the Strong Steel Foundry Company's new plant at Hertel avenue and the Erie Railroad, Buffalo, 300 tons, and the Charles F. Ernst Sons Iron Works was low bidder for the steel for the St. Mary's Industrial School Building, Lancaster, N. Y., about 100 tons. Bids are soon to be received for the Queen City Improvement Company's 6-story mercantile building at Delaware avenue and Chippewa street, Buffalo, requiring about 600 tons, and for the steel for the manufacturing and warehouse building to be erected at Greece, N. Y., by the Clark Paper & Mfg. Company of Rochester, requiring a small tonnage.

**Old Material.**—There is a slight improvement in the general situation, owing principally to the demand from

outside districts, particularly for borings and turnings and heavy melting steel. The local mills have not yet removed the embargo on the receipt of scrap material mentioned in last week's report, and the amount of material moving is therefore of limited volume. Dealers believe, however, that in a few days local mill stocks will require replenishment and the demand assume larger proportions. We quote as follows, per gross ton, f.o.b. Buffalo:

|  |                    |
|--|--------------------|
| Heavy melting steel.....                     | \$12.75 to \$13.25 |
| No. 1 railroad wrought.....                  | 13.50 to 13.75     |
| No. 1 railroad and machinery cast scrap..... | 13.50 to 14.00     |
| Old steel axles.....                         | 16.50 to 17.25     |
| Old iron axles.....                          | 21.00 to 21.50     |
| Old car wheels.....                          | 12.50 to 13.00     |
| Railroad malleable.....                      | 12.50 to 13.00     |
| Boiler plate, sheared.....                   | 13.75 to 14.25     |
| Locomotive grate bars.....                   | 11.00 to 11.25     |
| Wrought pipe.....                            | 9.50 to 10.00      |
| Tank iron.....                               | 10.00 to 10.25     |
| Wrought iron and soft steel turnings.....    | 8.00 to 8.50       |
| Clean cast borings.....                      | 7.00 to 7.50       |

## St. Louis

ST. LOUIS, Mo., April 29, 1912.

Cumulative evidence indicates very strongly a renewal of the buying movement in all divisions. Prices generally are stiffly held and there is belief in further advances. Inquiries are of a type meaning purchases within a comparatively short time and in no case later than the first of July when many fiscal years will close.

**Pig Iron.**—Demand, especially for Southern iron, keeps up a good pace and the aggregate of orders has been excellent, although the largest individual sale was 1000 tons of No. 2 Southern. Orders, for the most part, have run in carload lots and from that up to 200 tons. Buyers expected for the last half delivery are being strongly advised by furnace representatives to determine their needs early to avoid contemplated increases in price. No. 2 Southern, Birmingham basis, is very firmly held at \$11, and all quotations of recent date are held subject to recall on short notice. Inquiries are good, with one for 3000 tons of malleable for last half delivery. Basic, carwheel, Northern and other irons show no change except for firmer prices. No. 4 Southern is very scarce and the last quotation was \$10.25 with very little to be had.

**Coke.**—The movement in coke has been good on specifications and these have even been above contract requirements, but there has been practically no new business of importance. Foundry grades, best 72-hr., both Connellsville and Virginia, for both prompt shipment and deferred delivery, are strongly held at \$2.75 at oven. By-product coke is firm at \$5.40 delivered in St. Louis.

**Old Material.**—The scrap market is still in a waiting condition. The consumers are, apparently, determined not to buy, while the dealers with confidence in future prices have loaded up and are refusing to sell except at advanced prices. The only list of consequence out during the week was one from the Wabash of 800 tons. This closes next week. With very little doing, we quote f.o.b., St. Louis, as follows:

### Per Gross Ton.

|  |                    |
|--|--------------------|
| Old iron rails.....  | \$14.00 to \$14.50 |
| Old steel rails, re-rolling.....                             | 11.00 to 11.50     |
| Old steel rails, less than 3 ft.....                         | 11.25 to 11.75     |
| Relaying rails, standard section, subject to inspection..... | 21.50 to 22.00     |
| Old car wheels.....  | 12.50 to 13.00     |
| Heavy melting steel scrap.....                               | 10.50 to 11.00     |
| Frogs, switches and guards cut apart.....                    | 10.50 to 11.00     |

### Per Net Ton.

|   |                    |
|---|--------------------|
| Iron fish plates.....                       | \$12.50 to \$13.00 |
| Iron car axles.....                         | 17.50 to 18.00     |
| Steel car axles.....                        | 15.00 to 15.50     |
| No. 1 railroad wrought.....                 | 11.00 to 11.50     |
| No. 2 railroad wrought.....                 | 10.25 to 10.75     |
| Railway springs.....                        | 9.50 to 10.00      |
| Locomotive tires, smooth.....               | 11.50 to 12.00     |
| No. 1 dealers' forge.....                   | 8.50 to 9.00       |
| Mixed borings.....                          | 6.25 to 6.75       |
| No. 1 busheling.....                        | 9.00 to 9.50       |
| No. 1 boilers, cut to sheets and rings..... | 6.00 to 6.50       |
| No. 1 cast scrap.....                       | 10.00 to 10.50     |
| Stove plate and light cast scrap.....       | 8.00 to 8.50       |
| Railroad malleable.....                     | 9.00 to 9.50       |
| Agricultural malleable.....                 | 8.00 to 8.50       |
| Pipes and flues.....                        | 8.00 to 8.50       |
| Railroad sheet and tank scrap.....          | 7.50 to 8.00       |
| Railroad grate bars.....                    | 8.50 to 9.00       |
| Machine shop turnings.....                  | 7.00 to 7.50       |

**Finished Iron and Steel.**—There is a very enthusiastic belief in large future buying, and tentative inquiries indicate that in standard rails there will be some considerable activity as soon as the fiscal years of a number of railroads are completed on June 30. At the same time the steel mill representatives confess

doubt as to their ability to make prompt delivery on such business coming so late. Fabricating shops are all busy, there is much new business in sight and coming out and there is a growing insistence on quick shipment, something difficult to get. In plates there is a heavily increased demand in spite of the fact that deliveries are put back to July and even August. Prices for structural shapes and plates are firmly held at the recent advance to 1.25c. Pittsburgh. Bars are in strong demand and consumers are pressing for deliveries, showing that the needs are close on the heels of supplies. The prices are strong at 1.20c. Pittsburgh. In light rails there is more activity than for two years or more, especially in the demand from the mining interests, while the lumber people are increasing their purchases rapidly. Prices have advanced fully \$3 per ton and 30-lb. rails are practically on a parity with standard rails, allowing for a \$2 differential. Track fastenings are and have for some time been in exceptional demand with the producing plants well sold ahead on existing requisitions. Prices are strong at \$1.60 St. Louis with an advance expected.

### The British Iron Market

#### Advances in Pig Iron, Ferromanganese, Rails, Bars and Tin Plates

Wire advices today are that the German Steel Works Union has been renewed for five years.

(By Cable)

MIDDLESBROUGH, ENGLAND, May 1, 1912.

The iron and steel markets show great firmness and there is an all-around scarcity of material. Pig iron stocks continue to decrease. The coke supply is far from normal. Midland makers of pig iron have raised their prices 5s. to 7s. 6d. over those asked before the coal strike. Returns indicate that on March 31 only 55 furnaces were running out of 498.

Steel is strong. There is a growing demand for tin plates and prices are advancing on the strength of the higher prices for sheet bars and for tin.

Ferromanganese for the United States has been advanced \$2.50 or to \$46, c.i.f. Baltimore. We quote the market as follows, noting advances over last week's prices in pig iron, German steel bars and billets, steel rails and tin plates:

Cleveland pig iron warrants (closing Tuesday), 53s. 8d. against 53s. 6d. one week previous.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 54s. 6d.

German basic steel bars, f.o.b. Antwerp, £5 14s. to £5 15s. (an advance of 5s. in the week).

German sheet bars, f.o.b. Antwerp, £5.

German 2-in. billets, f.o.b. Antwerp, 95s.

Steel bars, export, f.o.b. Clyde, £7 5s.

Steel joists, 15-in. export, f.o.b. Hull or Grimsby, £6 15s., up 2s. 6d.

Steel ship plates, Scotch, delivered local yard, £7 12s. 6d., an advance of 2s. 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 5s.

Steel rails, export, f.o.b. works port, £6 5s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 14s. 6d. to 14s. 9d., October-December.

### The German Iron Market

#### One of the Most Prosperous Periods Ever Known

BERLIN, April 18, 1912.

The iron market shows undiminished strength. It is coming to be more and more recognized that the trade is now in the midst of one of the most prosperous periods that it has ever known and that it is based on sound business methods and conditions. There is little disposition among the trade organizations to take the utmost possible advantage from the existing situation by unduly advancing prices; nor do they, as in the great boom of 12 years ago, use their power to compel consumers to place extended contracts.

#### Bar Prices Still Rising

After the numerous price advances reported in this correspondence a week ago it could hardly have been expected that the upward movement would make further progress this week, yet such is the case. Prices

are again higher in several lines and other advances are in sight. The Upper Silesian wholesale dealers have marked up rolled products by 5 marks. A strong upward movement in bars is reported from the Luxemburg-Lorraine district and the minimum price has been raised to 114 marks, bands to 116 marks and universal iron to 122 to 125 marks. All the mills appear to have sold their full product to the end of September and some business has already been done for the fourth quarter of the year at the above prices. The mills are stipulating 10 to 16 weeks as delivery limit, and in some cases 24 weeks. In addition to the advance on bands recently made by the trade combination the export price has also been marked up 5 marks; and it is added that the calls for delivery on contracts are extraordinarily brisk. The mills are heavily supplied with orders for six months ahead.

The rise in the price of bars within four weeks is stated to have been between 3 and 5 marks. In the Rhenish-Westphalian district the minimum prices are 118 to 120 marks and export prices have fully kept pace with home prices. The reports describe the export demand for bars as enormous. From Argentine in particular have very large orders been taken within the past few weeks and Japan and India have also been sending in big orders. The export price for basic bars has now risen to 112 to 115 marks, f.o.b. Antwerp.

It is announced that bars will be marked up 2 to 3 marks to-morrow on the Düsseldorf Exchange, but this rise will apparently be merely to take account of advances already made by producers. The manufacturers of heavy plates are preparing to mark up prices for the next quarter and are arranging the details. Mills running on such products continue to have an unusual rush of orders. Business in ship plates is still very brisk; the selling agency for this specialty reports shipments of 23,200 tons in March, as against 21,500 tons in February.

#### Pig Iron Sales Brisk

After a meeting of the Pig Iron Syndicate held several days ago the market summary given out stated that sales had been very brisk since the previous meeting, that most consumers had covered their requirements for the rest of the year and that for this reason new business has latterly grown more quiet. The foreign demand, the report says, is very heavy at rising prices. Calls for delivery are coming in very actively and stocks have been further reduced. From the Silesian district it is reported that the demand for pig is exceedingly active, that the furnaces are not able to produce iron as fast as consumers call for it and that there is a very heavy demand from Russia for foundry iron. From the Luxemburg-Lorraine district an extremely active demand for pig for the second half-year is reported and calls for delivery are very brisk and prices firm. The same market reports uncommon activity in bars and structural shapes and the mills are demanding 3 to 4 months' time for delivery on new orders; in many products, it is added, the mills have more work in hand than ever before.

From the Belgian market a rise of 1 franc in puddling iron was reported by telegraph to-day; also plates and bars by 2.50 francs and bands by 5 francs. Orders for a total of 150,000 tons of pig have failed for the present to find takers in Westphalia, Luxemburg or in the Longwy district. Higher prices have also just been reported from the Scotch trade. A Vienna correspondent describes the position of the Austrian iron trade as extraordinarily favorable; orders are steadily increasing and stocks of iron and steel have been reduced to such a low point as has not been known for years.

#### The Hardware Trade

Late reports on the state of business in the hardware industry continue favorable. A considerable run of new orders is coming in. The manufacturers around Remscheid have just advanced the prices of all kinds of tools and general lines of hardware made in that region by 5 per cent. There is much dissatisfaction with prices in other lines of hardware, especially since the last advances in pig iron and certain classes of steel. The cutlery trade in and around Solingen is working briskly and a good part of the product is going abroad. Some of the manufacturers there complain that the customs administration at New York has about made American business impossible for them. The export trade to England is not in a satisfactory shape, and this is also true of east Asia and the eastern Mediterranean. Makers of swords, bayonets and other military hardware have good South American orders. There is an active demand for bicycle and automobile parts, and also for farm implements and



tools. The demand for builders' hardware is good, but the spring trade has so far not met expectations, building operations having been retarded by the dearth of money. Manufacturers of general metal goods are overrun with orders, and prices are on a fairly satisfactory basis.

## New York

NEW YORK, May 1, 1912.

**Pig Iron**—So far as Eastern buying is concerned the pig iron market has been quieter in the past week than in the two preceding. New England consumers, including malleable shops, have done quite a little, several contracts of 1000 and 2000 tons being reported, and one for 3000 tons. Buffalo furnaces have been the principal sellers, as in recent weeks. Canal freights have lately been entering into transactions for points on the Sound, to which the rate is about \$1.50 on the average. To New York and Brooklyn it is figured that canal bottoms can be had at \$1.10 to \$1.35 from Buffalo, whereas the rail freight from Buffalo to Jersey City is \$2 and to New York City and Brooklyn \$2.45. While some consumers of iron have contracted for the entire second half of the year, others have not been willing to pay the advances asked by furnace companies in the recent heavy buying movement, and are still waiting to buy their iron for the last half. Blast furnace companies also have differed in their selling policy. Those having most or all of their own coke supply have sold freely to the end of the year, while those buying all their coke in the market have sold only moderately into the third and fourth quarters, since the basis of coke contracts for the second half of the year is still a matter of negotiation. It seems quite certain, however, that the advance in coke will be from 60 to 75 cents over contract prices prevailing for the first half of this year. We quote as follows for Northern iron at tidewater: No. 1 foundry, \$15.25 to \$15.50; No. 2 X, \$15 to \$15.25; No. 2 plain, \$14.75 to \$15. Southern iron is quoted at \$15.50 to \$15.75 for No. 1 foundry and \$15 to \$15.25 for No. 2 foundry.

**Finished Iron and Steel**—Sentiment is absolutely unanimous with regard to the decided betterment in conditions, but it is not as regards prices. Steel bars appear quite firm at the new level of 1.20c., Pittsburgh, but this is not thought to be true of plates, nor even of shapes. Where mills have rolling schedules practically completed for the second quarter, it is probable that a shading of prices could be obtained only in case of an attractive order, which could be made to fit into some spot in the rolling schedule. There is quite a little activity in building lines, as is to be expected at this time of the year, but the inquiries in general emanate from general contractors and indicate a preponderance of investment building rather than speculative building. The rate of manufacturing continues good, judging from the fact that specifications on contracts are maintained at a high rate, and the business in bars of one New York mill representative was twice as great for April as for March. In some quarters a belief that even higher prices than the present will prevail for the second half is voiced, in one case from the buyers' side. As stated, it is perhaps harder to get 1.25c., Pittsburgh, for plates than it is to close for other finished products at established prices. On top of this is an announcement by one of the large bar-iron producers that prices are a minimum at 1.35c., New York. Fabricators generally admit getting \$2 to \$3 a ton more than was obtained a few weeks ago. In rails, one of the latest developments is the placing with the Bethlehem Steel Company of an order of 8000 tons of 60-lb. rails for the South African Railways. Late last week the directors of the Frisco system, meeting in New York, determined on buying 6000 cars, mostly gondolas. The structural projects of importance which have come into the market, or are of the immediate future, include 7000 to 8000 tons for New York subway work under the Harlem River and 2000 tons for an office building in Providence, and the Boston & Maine is expected soon to inquire for structural work. Bids are in for a 7000-ton coal loading pier for the Norfolk & Western at Lamberts Point, Norfolk, and for 3000 tons for a meter repair shop for the Standard Gas Light Company at Avenue A and 110th street. Quite a little interesting steel work will undoubtedly be required for the false work for the Delaware, Lackawanna & Western concrete bridge work near Scranton. The Hinkle Iron Company has taken over 6000 tons lately, as follows: 1000 tons, Hippodrome, 165th street and Broadway; 1400 to 1500 tons for a 16-story building at Twenty-fifth street and Fourth avenue; 800 tons

for an abattoir, Forty-third street and First avenue; 700 tons for a 12-story building, 115 West Twenty-ninth street; 700 tons for a loft building at Chrystie and Stanton streets; 1200 tons for a building at 241 West Thirty-seventh street, and 800 tons for a building at 40 West Sixtieth street; it is probable that 90 per cent. of the structural work will be of Bethlehem shapes. The American Bridge Company has taken the 1100-ton structure for the East Haddam bridge over the Connecticut River; the Radley Steel Construction Company will erect a 500-ton loft on Thirty-second street, near Madison avenue; the Phoenix Bridge Company is to supply the 275 tons for pier 34, North River, for the Lehigh Valley, and the 800 tons required for the Thirty-ninth street ferry, Brooklyn. The McClintic-Marshall Construction Company has a contract for 200 tons for extensions to the Phillipsburg works of the Ingersoll-Rand Company; the G. W. & F. Smith Iron Works is to build a 300-ton brew house for the Roessle brewery, Boston, and the King Bridge Company is to supply 100 tons, for three bridges for the New York Central, one at Auburn. The Plimpton Building, Fifth avenue and Thirteenth street, 900 tons, is also closed. The Boston Transit Commission is inquiring for 200 tons of work for the Dorchester tunnel. The Widener hotel project, Atlantic City, has been enlarged and the 3000 tons additional gives the American Bridge a total of 10,000 tons in this case. Quotations are: Steel bars, plain structural material and plates, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material from store, New York, 1.70c. to 1.80c.

**Cast Iron Pipe**—The market presents no special feature. No important public lettings are in sight in this immediate vicinity but private buying continues in fair volume. Carload lots of 6 in. can be had from some makers at \$21, tidewater, per net ton, while others hold their product at \$22 to \$23.

**Old Material**—The demand for steel scrap appears to have subsided with the covering of the Dreifus contracts, the transactions the past week having been light. Old car wheels are in strong demand and prices are higher. An offer of \$14, New York, for 1000 tons was refused. Borings and turnings are reasonably active at slightly higher prices. Foundry scrap is moving more freely, with an upward tendency in prices. Quotations are as follows, per gross ton, New York and vicinity:

|   |                    |
|---|--------------------|
| Old girder and T rails for melting..... | \$10.75 to \$11.25 |
| Heavy melting steel scrap.....          | 10.75 to 11.25     |
| Relaying rails.....                     | 20.00 to 20.50     |
| Re-rolling rails (nominal).....         | 12.50 to 13.00     |
| Iron car axles.....                     | 21.00 to 21.50     |
| Old steel car axles.....                | 15.25 to 15.75     |
| No. 1 railroad wrought.....             | 13.75 to 14.25     |
| Wrought iron track scrap.....           | 12.75 to 13.25     |
| No. 1 yard wrought, long.....           | 11.75 to 12.25     |
| No. 1 yard wrought, short.....          | 11.25 to 11.75     |
| Light iron.....                         | 5.25 to 5.75       |
| Cast borings.....                       | 7.75 to 8.25       |
| Wrought turnings.....                   | 8.75 to 9.25       |
| Wrought pipe.....                       | 10.50 to 11.00     |
| Old car wheels.....                     | 13.00 to 13.50     |
| No. 1 heavy cast, broken up.....        | 12.00 to 12.50     |
| Stove plate.....                        | 9.50 to 10.00      |
| Locomotive grate bars.....              | 9.50 to 10.00      |
| Malleable cast.....                     | 10.00 to 10.50     |

**Ferroalloys**—Continued scarcity, lively consumption and higher prices are the features of ferromanganese. For 80 per cent., \$46, Baltimore, is the price asked, and it has been obtained in the case of some carload lots. Some large shipments are en route here, but predictions are that the fresh arrivals will not have much, if any, effect in easing the market. A strike of stevedores in Baltimore has been a slight detriment to the business of some importers. Ferrosilicon, 50 per cent., remains unchanged at \$70, Pittsburgh, for small lots, with reductions for large quantities.

## Metal Market

NEW YORK, May 1, 1912.

### The Week's Prices

|         |       | Copper, New York. |        |           |            | Lead      |            | Spelter   |            |
|---------|-------|-------------------|--------|-----------|------------|-----------|------------|-----------|------------|
|         |       | Electro-lytic.    | Tin.   | New York. | St. Louis. | New York. | St. Louis. | New York. | St. Louis. |
| April.  | Lake. |                   |        |           |            |           |            |           |            |
| 25..... | 16.00 | 15.87½            | 44.65  | 4.20      | 4.07½      | 7.00      | 6.85       |           |            |
| 26..... | 16.00 | 15.87½            | 45.20  | 4.20      | 4.07½      | 6.95      | 6.80       |           |            |
| 27..... | 16.00 | 15.87½            |        | 4.20      | 4.07½      | 6.95      | 6.80       |           |            |
| 29..... | 16.00 | 15.87½            | 46.45  | 4.20      | 4.07½      | 6.90      | 6.75       |           |            |
| 30..... | 16.00 | 15.87½            | 46.05  | 4.20      | 4.07½      | 6.90      | 6.75       |           |            |
| May     |       |                   |        |           |            |           |            |           |            |
| 1.....  | 16.00 | 15.87½            | 46.37½ | 4.20      | 4.07½      | 6.90      | 6.75       |           |            |

Copper is dull at steady prices. Tin is higher and strong. Lead is quiet and lower in St. Louis. Spelter is weaker. Antimony is quiet with Hallett's at 7.62½c.

## New York

**Copper.**—Throughout the last week the copper market has been very dull despite offerings by second hands at shaded prices, as buyers were not in evidence. The large producers are adhering to their prices of 16c. and over, although restricted quantities of electrolytic copper can be bought at 15.87½c. from second hands or interests not associated with the big sellers. At the present time there is so little business doing that the drift of the market is not indicated. For Lake copper 16c. is asked and it is firm at that price. Efforts to obtain Lake copper at 15.95c. were unproductive. On the other hand there are few buyers who will meet 16c. For electrolytic 15.87½c., cash, New York, and 16c., delivered to the Naugatuck Valley, cash 30 days, are the prices made by what little trading there has been. The price of copper in London to-day is £70 7s. 6d. for spot and £71 3s. 9d. for futures. The exports of copper last month reached the comparatively small total of 20,971 tons, with one day more to add.

**Pig Tin.**—The price of tin has advanced almost daily throughout the week and to-day 46.37½c., New York, is quoted. The market has been dull, but its strength has not been impaired by the lack of business. The situation was due to anticipation of the statistics for the month. These came out to-day and show that no error had been made in estimating the figures. The world's total visible supply of tin at the end of April, 1912, is only 11,893 tons as compared with 14,441 tons at the end of April, 1911, and with 15,694 tons March 31, 1912. Further influence in causing the upward trend in price is a belief that European consumers are not sufficiently covered, while foreign dealers stocks are not what they should be, together with the good consumption here. It is natural to assume that tin will hold its higher level for at least a little time to come. The London market fluctuated greatly within the week, on April 29 reaching £212, while April 26 it sold at £206. The deliveries into consumption in April equalled expectations and amounted to 5400 tons. The previous record was 5100 tons. The arrivals in April were 6404 tons. There is afloat to-day 1270 tons. The amount of tin in stock and landing to-day is 3065 tons. The price of spot tin in London is £211 10s. and futures £209.

**Tin Plates.**—No particular interest has developed in tin plates in the New York market within the last week. There has been a further advance in the price of tin plates laid down at Swansea, Wales, and 14s. 6d. is now quoted. As was the case with previous advances, the labor disturbances are given as the cause of this latest one. In New York \$3.54 is quoted for 100-lb. coke plates.

**Lead.**—Dullness has prevailed in the lead market in the last week, apparently because consumers were well supplied and producers busy filling contracts. There has been so little doing that prices in St. Louis by interests outside of the combination sold lead at 4.07½c. The New York price remains at 4.20c.

**Spelter.**—Weakness and lower quotations developed in the spelter market in the last few days as a result of which prompt shipment spelter can be had at 6.90c., New York, and 6.75c., St. Louis, with future positions still lower. Reports from the West are that the flood in the ore districts has interfered with production and it is predicted that this will be felt by the trade.

**Antimony.**—Demands for antimony are light and prices have undergone no change except that Hallett's can now be had for 7.62½c. and ¼c. lower than last week. Cookson's is quoted at 8c. and Hungarian and Chinese grades at 7c.

**Old Metals.**—The market continues quiet. Dealers' selling quotations are as follows:

|                                 | Cents per lb.  |
|---------------------------------|----------------|
| Copper, heavy and crucible..... | 14.75 to 15.00 |
| Copper, heavy and wire.....     | 14.25 to 15.00 |
| Copper, light and bottoms.....  | 13.50 to 13.75 |
| Brass, heavy.....               | 9.50 to 9.75   |
| Brass, light.....               | 7.75 to 8.00   |
| Heavy machine composition.....  | 12.50 to 13.00 |
| Clean brass turnings.....       | 9.00 to 9.25   |
| Composition turnings.....       | 10.50 to 11.00 |
| Lead, heavy.....                | 4.00           |
| Lead, tea.....                  | 3.75           |
| Zinc, scrap.....                | 5.50           |

## Chicago

APRIL 30.—Sales of metals have been largely of a routine character, and such small changes in prices as can be noted are in the direction of an easier rather than more advanced position. This is true of copper and lead, while tin and spelter prices continue firm. We quote as follows: Casting copper, 16c.; Lake, 16.25c., in

carloads for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, carloads, 45.50c.; small lots, 47.50c.; lead, desilverized, 4.15c. to 4.20c., for 50-ton lots; corroding, 4.40c. to 4.45c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.80c. to 6.90c.; Cookson's antimony, 8.50c., and other grades, 7.50c. to 8c., in small lots; sheet zinc is \$8.60, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 13.50c.; copper bottoms, 12c.; copper clips, 12.25c.; red brass, 11.75c.; yellow brass, 9.75c.; lead pipe, 3.80c.; zinc, 4.75c.; pewter, No. 1, 28c.; tinfoil, 32c.; block tin pipe, 42c.

## St. Louis

APRIL 29.—The metal market generally shows a fairly good business for the week. Lead is a shade lower in the prices offered, 4.10c. to 4.12½c., but holders will not let go at that figure. Spelter is firmer at 6.75c. to 6.85c., according to delivery. Tin is higher at 45.50c. to 45.70c. Lake copper is quotable at 16.47½c. to 16.60c. and electrolytic at 16.35 to 16.47½c. Cookson's antimony is steady at 8.35c. In the Joplin ore district the production has increased rapidly and is now in excess of 6000 tons per week. Zinc ore has been held firmly with the basis price for 60 per cent. at \$56 per ton and the top price for choice lots running to \$58. Calamine has been in good demand, with \$26 to \$28 the price for 40 per cent. and the top price at \$33. Lead ore has receded to about \$54. For miscellaneous scrap we quote as follows: Light brass, 5c.; heavy brass and light copper, 9c.; heavy copper and copper wire, 10c.; zinc, 3.50c.; lead, 3.50c.; pewter, 21c.; tinfoil, 31c.; tea lead, 2c.

## Iron and Industrial Stocks

NEW YORK, May 1, 1912.

The stock market has maintained its strength fairly well. Even those stocks which have recently had so rapid an advance appear to be able to hold closely to the high figures reached. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

|                             |           |                           |           |
|-----------------------------|-----------|---------------------------|-----------|
| Allis-Chalm., com....       | ¾-1¾      | Pressed Steel, com....    | 35¼-36¼   |
| Allis-Chalm., pref....      | 2¾-4¾     | Pressed Steel, pref....   | 103-103½  |
| Bald. Loco., com.....       | 55        | Railway Spring, com. 34   | -37½      |
| Bald. Loco., pref....       | 106¾-107  | Railway Spring, pref....  | 101       |
| Beth. Steel, com.....       | 37¼-39½   | Republic, com.....        | 23¾-24¾   |
| Beth. Steel, pref....       | 71¾-73    | Republic, pref.....       | 77¾-81¾   |
| Can, com.....               | 35-39¾    | Sloss, com.....           | 48-52     |
| Can, pref.....              | 115¼-117¾ | Pipe, com.....            | 17¾-18¾   |
| Car & Fdry., com....        | 60-61½    | Pipe, pref.....           | 54½-55½   |
| Car & Fdry., pref....       | 116¾-118  | U. S. Steel, com.....     | 70¾-73¼   |
| Steel Foundries.....        | 35½-38    | U. S. Steel, pref....     | 112¾-113¾ |
| Colorado Fuel.....          | 29¾-31    | Westinghouse Elec. 76     | -77¾      |
| General Electric.....       | 169-171½  | Am. Ship, com.....        | 56        |
| Gr. N. Ore Cert.....        | 90½-41¾   | Am. Ship, pref.....       | 103       |
| Int. Harvester, com. 113¾   | -117½     | Chic. Pneu. Tool....      | 48½-49½   |
| Int. Harvester, pref. 120   | -121      | Cambria Steel.....        | 43½-44¾   |
| Int. Pump, com.....         | 29¾-31½   | Lake Sup. Corp.....       | 30½-32¾   |
| Int. Pump, pref....         | 82-84     | Pa. Steel, pref.....      | 100       |
| Locomotive, com....         | 43¼-44¾   | Warwick.....              | 10½-11    |
| Locomotive, pref....        | 108¾-108¾ | Crucible Steel, com. 12¼  | -12½      |
| Nat. En. & St., com. 16     | -17½      | Crucible Steel, pref. 84  | -84¾      |
| Nat. En. & St., pref. 90    | -91       | Harb. Wk. Ref., com.....  | 39        |
| Pittsburgh Steel, pref. 100 | -102¾     | Harb. Wk. Ref., pref..... | 98½       |

Stockholders of the Westinghouse Air Brake Company have voted unanimously to increase the capital stock from \$14,000,000 to approximately \$20,000,000.

Stockholders of the Torrington Company have voted to increase the capital stock from \$3,000,000 par value to \$4,500,000, by the issue of 52,000 new shares of common stock (\$25 par); authorized the directors to purchase \$372,000 par value of the capital stock of the Standard Company, and issue in payment therefor \$279,000 new common stock; authorized the directors to offer \$960,000 new stock to both common and preferred stockholders for subscription at par, and authorized the directors to dispose of the remainder of \$1,300,000 new stock and also the portion of \$960,000 of stock which may remain unsubscribed for by stockholders.

## Dividends Declared

The Westinghouse Air Brake Company, stock dividend of 33½ per cent., payable July 10.

The International Harvester Company, regular quarterly, 1¼ per cent. on the preferred stock, payable June 1.

The Pressed Steel Car Company, regular quarterly, 1¼ per cent. on the preferred stock, payable May 22.

The United States Steel Corporation, regular quarterly, 1¼ per cent. on the preferred stock, payable May 29, and 1¼ per cent. on the common, payable June 29.



## Personal

H. R. Cobleigh, formerly mechanical editor of *The Iron Age* and latterly manager of publicity for the International Steam Pump Company, has been appointed managing editor of *Power*.

W. A. Daley, manager of the Colcord-Wright Machinery & Supply Company's Kansas City branch, has resigned to accept the position of manager of the machinery department of the Eccles & Smith Company, San Francisco, Cal. H. E. Strohm, who has been with the Colcord-Wright Company the past two years at St. Louis, succeeds Mr. Daley as manager of the Kansas City branch, 309 Victor Building, Kansas City, Mo.

Paul M. Warburg, of Kuhn, Loeb & Co., bankers, New York, has been elected a director of the Westinghouse Electric & Mfg. Company, succeeding Charles A. Moore, resigned.

George W. Smith, formerly superintendent of the Ingersoll Milling Machine Company, Rockford, Ill., has accepted a similar position in the tractor department of the J. I. Case Threshing Machine Company, Racine, Wis.

Jason Paige, until recently contracting engineer for the Pittsburgh Steel Products Company at Chicago, is now associated with the sales department of McClernan & Co., People's Gas Building, Chicago, to continue in the sale of steel products.

A. Schaeffer, representing the United Steel Company at Chicago, announces the removal of his office from 1132 Commercial National Bank Building to room 608 in the same building. The new quarters afford more adequate facilities.

R. J. Wysor has been made chief chemist of the Bethlehem Steel Company, South Bethlehem, Pa., succeeding Robert C. Kresge, who recently resigned.

W. D. Ward, of the Pelton Water Wheel Company, San Francisco, Cal., is on his way to Tahiti in connection with a projected hydroelectric plant.

George A. Dow, of the Dow-Willans-Diesel Engine Company, San Francisco, Cal., has returned from a European trip.

Dr. Th. Schuchart, the efficiency expert of the Thyssen interests at Mülheim-Ruhr, has been studying shop and wage systems in the United States, spending the past three weeks in the Pittsburgh district. He will return to Germany about the middle of May.

James Kent, formerly in the Pittsburgh office of the Fort Wayne Electric Company, Fort Wayne, Ind., has resigned to become vice-president of the George T. Ladd Company, engineering and power equipment, 1620 Farmers Bank Building, Pittsburgh.

Axel Welin, of the Welin Davit & Engineering Company, Ltd., London, England, arrived in New York from abroad April 28. His company equipped the ill-fated Titanic with 16 sets of specially designed double-acting davits of his invention. The double-acting feature was intended to enable the davits to handle 32 or more lifeboats. Prior to devoting himself to marine life-saving appliances, Mr. Welin was an ordnance expert and was connected with gun factories in Sweden and in England. He invented the Welin breech block. His visit to this country is in connection with the loss of the Titanic. In the United States the Welin davits are handled by the Welin Davit and Lane & De Groot Company, Long Island City, of which Capt. A. P. Lundin is president. This company will soon change its name to the Welin Marine Equipment Company.

A. C. Cook, formerly New York manager for the Warner & Swasey Company, Cleveland, sailed April 30 from Boston for Europe, where he is to remain about two years in the interests of the company. His headquarters abroad will be with Charles Churchill & Co., 9 Leonard street, Finsbury, London, E. C.

A. M. Kittredge has resigned as president of the Barney & Smith Car Company, Dayton, Ohio, and will retire from business after 32 years of continuous service. His successor has not yet been chosen.

R. H. Cox, formerly on the editorial staff of the Cincinnati Enquirer, has been appointed civic secretary of the

Business Men's Club, Cincinnati, Ohio, succeeding John M. Manley, who recently resigned to accept a position with the Hissey-Wolf Machine Company.

R. D. Jenkins, who has been the Cleveland sales manager of the Domhoff-Joyce Company, dealer in pig iron and coke, on May 1 became associated with the Chicago office of that company of which his brother, C. H. Jenkins, is manager. His successor in the Cleveland office has not been appointed.

## Obituary

HUGH ADDISON REED, Pittsburgh, Pa., one of the first to engage in the machine tool business in that district, died April 23, aged 58 years. He had not enjoyed good health for the past year. At the time of his death he was president of the Baird Machinery Company, 123 Water street, Pittsburgh. He was born in the old city of Allegheny and spent his entire life in the vicinity of Pittsburgh. His early education was received in the public and high schools of the city. At an early age he became interested in the business which he followed for more than 40 years. He enjoyed a wide acquaintance among the engineers and machine tool builders of the country. He was a member of the Engineers' Society of Western Pennsylvania, Technischer Verein and the Unitarian Church.

WILLIAM HAZELTON, who was widely known in the machinery, mill and electrical trades, died April 21 at White Plains, N. Y., after a long illness, aged 52 years. He was last connected with the Yale & Towne Mfg. Company as New York and New England district sales manager of the hoisting machinery department. At one time he was active in the electrical field, having been a member of the firm of Chadbourne, Hazelton & Co., Philadelphia, which in 1888-1890 acted as agent for the Sprague Electric Railway & Motor Company. His firm initiated contracts for the building of electric street railroads in Atlantic City, Wilkes-Barre, Reading, Wilmington and other cities in and near Pennsylvania during the first rush in the construction of such roads. He had also been connected with the Short Electric Company, Cleveland, Ohio.

JAMES E. THOMAS, a pioneer foundryman of Newark, Ohio, died April 19, aged 83 years. He was born in England. In 1855 he located in Newark and took charge of the Newark Machine Company. He established a foundry in 1867, which was incorporated in 1893 as the James E. Thomas Company. He had charge of the management of its business until two years ago, when ill health caused him to retire.

FRANCIS T. DWYER, president of the Standard Foundry Company and a director of the Peninsular Stove Company, Detroit, Mich., died April 22 of heart disease, aged 43 years. He was a son of Jeremiah Dwyer, president of the Michigan Stove Company, and was widely known in manufacturing circles. He leaves a widow and one daughter.

HINSDILL PARSONS, vice-president and general counsel of the General Electric Company, Schenectady, N. Y., was killed in an automobile accident near Albany, April 28. He was 48 years of age and leaves a widow.

The utilization of the heat of the gases from the open-hearth furnace was discussed recently in *Stahl und Eisen* by A. Pfoser. The temperature of the gases is 1100 to 1200 deg. F., and 31 per cent. of the heat developed by the combustion of the coal is lost in the exhaust. The suggestion is to utilize the gases to generate steam at say 150 lb. pressure without reducing the temperatures of the gases much over 550 or 575 deg. The total used energy of the fuel is placed at 27 per cent.; the loss by radiation of the furnace and regenerators 20 per cent., and loss by radiation of the gas producer and otherwise, 13 per cent., leaving the 31 per cent. mentioned.

Liveright Brothers, Philadelphia, Pa., makers of Live-right files, state that the demand has been so large that negotiations have been entered into for additional space for manufacturing purposes. The volume of business transacted by this firm is now the largest in its history.

## Pittsburgh and Vicinity Business Notes

The structural steel fabricating plant of the Noelke-Richards Iron Works, at Greensburg, Pa., formerly operated by the Brown-Ketchum Iron Works, was put in operation last week, a number of officials being present. The headquarters of the company are at Indianapolis, Ind. A number of improvements have been made in the works by the new owner.

The Board of Water Commissioners of Erie, Pa., will receive proposals until May 17 for a 24,000,000-gal. mechanical filter plant, rebuilding the pump station and furnishing pumping machinery, boilers and equipment in accordance with plans and specifications of Chester & Fleming, consulting engineers, Pittsburgh.

Press reports that the Youngstown Sheet & Tube Company, Youngstown, Ohio, will build additional tube mills are officially denied. The only new work under erection by the company at this time is the open-hearth steel plant.

The Kanawha Engineering Company, recently incorporated at Charleston, W. Va., will act as manufacturers' representative for steam and electrical machinery. It will not at present erect any buildings nor be in the market for any equipment, but possibly may do so later as the necessity arises, it will take contracts for complete installations in its lines.

The Struthers-Wells Company, Warren, Pa., has placed contracts for additions to its plant which will increase its capacity about 75 per cent., mostly in the boiler shop and plate work departments. Some of the new tools necessary for these additions have been purchased, but the company is in the market for two cranes, bending rolls, punches, etc.

The Blaisdell Machinery Company, Bradford, Pa., will possibly build an addition to its plant to take care of increased business in vacuum cleaners. Some improvements are also to be made to its old plant which is devoted to the manufacture of air compressors.

The Titusville Forge Company, Titusville, Pa., recently installed two new oil-fired annealing furnaces completely equipped with pyrometers, and an oil quenching tank capable of taking work up to 50 in. in diameter and 25 ft. long, and is putting in a complete grinding department for finishing crank shafts. The company has a fair amount of work booked, a portion of which consists of ordnance work for the Government.

The McInnes Steel Company, Ltd., Corry, Pa., has put on the market two new brands of tool steel, one of which is known as McInnes-V high speed steel which is especially adapted to high speed cutting, particularly along the lines of tool turning, also McInnes-V Cello oil hardening steel for die taps and reamers. The company guarantees this steel not to crank or shrink in hardening. It has also begun the manufacture of chrome-nickel steel for automobile parts, for which strong claims are made.

The Pittsburgh office of the Electric Controller & Mfg. Company of Cleveland, Ohio, has been moved from the Frick Building to room 1539 Oliver Building.

A new company composed of F. M. Bowman, Wayne Rawley and A. Bovard, formerly connected with the Riter-Conley Mfg. Company, is inspecting sites in the Pittsburgh district and proposes to erect a new plant for the manufacture of steel centers and other steel specialties used by the Blaw Collapsible Steel Centering Company.

The H. K. Porter Company, Pittsburgh, builder of light locomotives, has placed on the market a gasoline locomotive for use in coal mines. The engine is of the four-cylinder type. Orders for it have been received from the Jewell Ridge Coal Corporation, Thomas Coal Company, Astoria Light, Heat & Power Company and others.

The Warren Axe & Tool Company, Warren, Pa., has voted to increase its capital stock to \$200,000 to handle its growing business in axes and logging tools. The company contemplates the erection this year of a factory at St. Catharines, Ont., Canada, which will make a complete line of axes and logging tools. The Canadian company will be known as the Canadian Warren Axe & Tool Company, Ltd., and will have a paid up capital of \$150,000.

The Oil City Boiler Works, Oil City, Pa., manufacturer of water tube boilers, has recently added a line of house heating boilers for steam and hot water.

The Economy Supply & Mfg. Company, Pittsburgh, has applied for a charter to manufacture and sell light

machinery and specialties. The incorporators are H. W. Cleland, G. W. Cleland and E. C. Stafford, all of Pittsburgh.

## Titanium Rail Service

From the Titanium Alloy Mfg. Company, Pittsburgh, Pa., Charles V. Slocum, general sales agent, the following information has been obtained regarding the wear-resisting qualities of titanium rails:

In August, 1910, the Lehigh Valley Railroad placed in service for comparative trial a number of titanium open-hearth rails in competition with plain open-hearth rails laid at the same time. The plain rails were laid on a curve of 5 deg. 56 min. and the titanium rails were laid on a curve of 6 deg. 16 min. In April of this year, after 20 months' service, measurements were taken by R. W. Hunt & Co., engineers, showing that the ratio of wear was 54 per cent. in favor of the titanium rails.

In August, 1910, the Baltimore & Ohio railroad placed in service on a 9 deg. curve on its Cumberland Division a number of titanium Bessemer rails in competition with plain open-hearth rails. Measurements were taken by R. W. Hunt & Co. in July, 1911, after 338 days' service. This trial showed a ratio of wear of 56 per cent. in favor of titanium.

In September, 1910, the Boston & Maine Railroad laid a number of titanium open-hearth rails and in October laid a number of plain open-hearth and plain Bessemer rails of three different makes in competition with them. Measurements were taken August 3, 1911, by R. W. Hunt & Co. The ratio of wear in this trial, after 11 months' service, was from 40 to 118 per cent. in favor of the titanium rails.

In April, 1911, the Boston Elevated Railway Company laid a number of titanium open-hearth rails in competition with plain open-hearth rails on a curve with a radius of 100 ft. Measurements were taken after 214 days by R. W. Hunt & Co. The ratio of wear in this time was 41 per cent. in favor of the titanium rails.

## American Sheet and Tin Plate Association

A meeting of the Association of American Sheet & Tin Plate Manufacturers was held in the Fort Pitt Hotel, Friday, April 26. W. S. Horner, American Rolling Mill Company, Middletown, Ohio, was in the chair, and J. J. O'Connor was secretary. Reports were heard from the various committees appointed at the previous meeting. The committee having charge of the preparation of a standard contract for sales of sheets and tin plate stated that it was making progress and hoped to present a report at the next meeting. The belief prevails that unless all the tin plate and sheet makers agree to adopt this form of contract it will be without value. The committee on spelter also reported, but so far has made little progress. The association contemplates establishing a central agency for the purchase of spelter for all its members, but nothing definite has been done. The consideration of these two subjects occupied practically the entire attention of the association while it was in session. The Youngstown Iron & Steel Company, Youngstown, Ohio, and the Osterberg Tin Plate Company, Waynesburg, Pa., were admitted to membership.

**A Correction.**—In the general review of the iron market in our issue of April 25 it was stated that "large fabricating contracts continue to tempt concessions, the 10,000 tons for the new Brier Hill open hearth plant at Youngstown bringing out a price figuring back close to 1c. at mill for plain material." The statement is made to *The Iron Age* from an authoritative source that the contract in question was taken at a figure based on a mill price of 1.15c. for plain material.

Furnace B of the Detroit Iron & Steel Company, Detroit, Mich., and the C stack of the Buffalo Union Furnace Company, Buffalo, N. Y., will be blown in early in May as soon as a supply of ore can be secured. The second stack of the Toledo Furnace Company, Toledo, Ohio, will probably go in blast in about two weeks. The blowing in of this stack has been delayed because of uncertainty as to the coke supply.



## Baltimore Industrial Notes

The Ellicott Machine Company has practically completed its new branch plant on the quarantine site and now has it in partial operation. New business in dredging machinery and equipment is reported rather light, although sufficient is in hand to keep the plants well occupied for some time ahead.

Secretary Goldsborough of the Baltimore Factory Site Commission states that negotiations for the establishment of a steel casting plant in this city, in which Pittsburgh parties are interested, are progressing satisfactorily. Several other projects leading toward the establishment of industrial plants in Baltimore are under consideration, several of which appear quite favorable.

Jacob Epstein, of the Baltimore Bargain House, is considering plans for a large new warehouse to adjoin a present warehouse at Scott and Wicomico streets. The building will probably be four stories and of concrete construction.

The Carnegie Steel Company is placing the large foundry building formerly occupied by the Baltimore Foundry Company, and acquired through its purchase of the property of the Baltimore Bridge Company, on which the building is located, in shape to be used for the storage, for stock purposes, of steel bars and miscellaneous shapes. The fabrication of considerable structural material of the mill and factory construction type for export is reported.

The Gandy Belting Company will, it is stated, further add to its plant capacity by the erection of a large addition on Lemmon street, at the rear of its plant. Tentative plans call for a three-story addition to conform in construction with its present buildings.

M. Suchting & Sons will erect a further addition to their box-making plant at 608-610-612 Portland street. The improvement will be 40 x 40 ft., three stories, and will conform to their present buildings. No additional equipment will be required, but machinery from crowded parts of their present plant will be installed in the addition when completed.

New business with the Chesapeake Iron Works has been principally small structural steel and ornamental iron work propositions. The demand has been fairly active, but few contracts involving any important tonnage have developed. Orders for a 120-ton building in North Carolina and one of 50 tons in Sweet Brier, Va., have been booked. Estimates are in on a 500-ton contract for the new warehouse addition for the Terminal Warehouse Company, Baltimore.

M. A. Long, engineer, Baltimore & Ohio Railroad, has prepared plans for a concrete fireproof electrical substation to be erected in the Mount Clare yards at Arlington avenue. The building is to be 58 x 88 ft., one story.

Wallace Stebbins & Sons have recently entered orders for a number of Fitzgibbons boilers, including one for the canning plant of S. J. Seneca, Havre de Grace, Md.; one for Rosenberg, Happ & Siegal, Baltimore, and one for the Blue Ridge Water Company, Blue Ridge, Pa. While the demand for engines has been inactive, shop supplies have been showing a steady improvement.

Henry Smith & Sons have the contract for a four-story brick addition to the mill plant to be erected for the William E. Hooper & Sons Company at Woodberry. The building will be of brick on concrete foundations, 102 x 161 ft., and of fireproof construction.

The Board of Awards, city of Baltimore, will receive proposals until May 15, under sanitary contract No. 89, for the construction of section 3, high level intercepting sewers, according to plans on file at the office of the Sewerage Commission, in the American Building. Under this contract approximately 1620 ft. of 42-in. cast-iron pipe, 1100 ft. of 10-in., 810 ft. of 36-in. and a number of special manholes will be required.

John D. Adt is maintaining a full capacity basis of operation in the various departments of the plant. Deliveries on export orders for special tobacco machinery are going forward and additional business is under negotiation. Orders recently have been largely for special machinery for various types, including equipment in connection with refrigerating machinery.

The Terminal Warehouse Company has awarded a contract to the Noel Construction Company for a six-story brick and concrete warehouse, adjoining its present ware-

house at Guilford avenue and Pleasant street. Owens & Sisoo are the architects, and plans call for a building 49 ft. 10 in. by 186 ft., with a steel frame and reinforced-concrete floors.

Riggs, Distler & Stringer, contracting engineers, have taken several contracts for low-pressure heating systems, including one to be installed in St. Margaret's Church. The engine trade has been quiet, although a fair amount of business has been done in connection with boilers. Inquiry is good and the prospects for an increased volume of business is reported favorable.

The Thomas C. Basshor Company notes a marked increase in the volume of business closed in the past month, compared with March. Orders for various classes of engines, boilers, tanks, etc., have been more numerous and include two special 150-hp. boilers for the Baltimore & Ohio Railroad, an internally fired boiler for the Pikesville Dairy Company, a stack and supplementary work for the Davidson Chemical Company, special dryers for the Tidewater Cement Company, Union Bridge, Md. Orders for a number of moderate sized engines for various canning plants have been taken, also boilers, engines, etc., for the Elder Paving & Construction Company, and a boiler and heating apparatus for the central power plant for the Garrett Estate. The company's boiler and tank-making department is particularly well engaged.

The Dix Mfg. Company, manufacturer of the Dix door hanger, notes an improvement in business conditions. Unfavorable weather conditions have retarded the usual early demand, particularly in the South, although from present indications a steady improvement in the demand for the company's product is anticipated.

Dietrich Brothers have taken considerable new business, particularly covering contracts for small and moderate quantities of both structural steel and ornamental iron work for warehouses and factory buildings, and are operating the plant on a much more satisfactory basis. Several contracts for steel work in connection with apartment houses have also been booked. A moderate volume of small inquiry is being figured on. The firm has completed its contract for the structural work in connection with the Maryland Casualty Company's addition.

## New Sheet Mill at Morgantown, W. Va.

The Pittsburgh Sheet & Tin Plate Company has been formally organized by George C. Sturgiss, president of the Board of Trade of Morgantown, W. Va., L. C. Taylor of Cambridge, Ohio, and associates. A site of 25 acres has been purchased near Morgantown, and plans are being prepared by the Schleiper-Daer Company, engineer, Ferguson Building, Pittsburgh, for a sheet mill plant. The buildings will have concrete foundations and steel construction. The main building will be 120 x 550 ft.; annealing building, 60 x 200 ft.; tinning building, 60 x 400 ft.; galvanizing building, 50 x 150 ft.; planishing building, 80 x 120 ft.; pressing and shaping building, 80 x 80 ft.; and office building 40 x 50 ft. The mill will be equipped with six hot mills, six stands of cold rolls and three electric traveling cranes of 25 tons capacity. The power plant will have boilers and engines for 2000 hp. and a 250-kw. electric plant to operate the cranes, hoists and small motors. A special line of planished sheets is to be made by the new company.

**Quartz Glass for Lamps.**—Quartz-mercury lamps were discussed in a paper read at a demonstration before the American Electrochemical Society April 19 in Boston, by F. W. Robinson, of the Hanovia Chemical & Mfg. Company, Newark, N. J. Quartz glass melts at about 1500 deg. F. higher than ordinary glass and with the high temperature of mercury vapor can therefore be used for smaller size lamps than is possible with the generally known type of mercury-vapor lamps. As a result the lamps, it appears, can be heavily loaded under a potential of 180 to 190 volts for a length of lamp of about  $4\frac{3}{4}$  in. with a relatively narrow tube, and an increase in light intensity is obtained with a current consumption of about 0.25 watt per candle-power. The quartz glass appears to make the lamps especially rich in ultra-violet rays and therefore especially valuable as a source of actinic light for photochemical and botanical research.

# German Syndicates and Export Trade

## A System Under Which Germany's Industries Have Made Marvelous Strides—Home Sentiment Favorable Rather than Antagonistic

BY C. A. TUPPER.

In making any comparison of the competitive powers of American and European manufacturers, based on costs of labor, material, transportation, etc., one should not lose sight of the very great influence of the syndicate system, which gives to foreign producers many advantages in the world's markets not possessed by the manufacturers of this country. There appears, however, to be a great deal of misconception in the minds of Americans concerning the purposes and scope of such organizations, which are confused with the popular idea of "trusts"; hence the following simplified explanation of what is undoubtedly a complex subject may be of value at this time.

### Germany the Syndicate Garden Spot

In Germany, where the "cartel" or syndicate system has been carried to its highest state of development, there are about 410 of these combinations, or more properly associations, controlling, in one way or another, all the principal avenues of trade. Among the best known of these to readers of *The Iron Age* are doubtless the Coal Syndicate (Kohlen-Syndikat), Pig Iron Syndicate (Roheisen-Verband), Steel Works Union (Stahlwerks-Verband) and Welded Products Syndicate (Vereinigung Schweisseisenwerke) of the Rheinland-Westphalia group. Their object has been, primarily, not only the maintenance of certain fixed standards of prices within the boundaries of the empire, but also the stimulation of export trade through the payment of private bounties and other means.

As a result of this policy there have been brought about a steady, normal demand for material and labor, large savings in the handling of raw and finished products, elimination of much of the waste in manufacturing, carriage and marketing, a lowering of prices to users as compared with what must otherwise have been charged in consequence of the rising scale of wages and cost of material, and the insurance of fair net profits on capital invested. These are among the principal advantages of the system, and they have all been made possible to a large extent through the relief of pressure on domestic trade by the syndicate methods of developing export business.

### Syndicate Evolution

Syndicates originated in associations designed to maintain the competitive power of their members; and through all the history of the movement that idea has never been lost sight of. The first syndicate was a selling convention, or "gentlemen's agreement," by which the members of the organization bound themselves not to dispose of what they had to offer at prices below a certain scale, which was changed from time to time by an executive committee to correspond with varying production costs, varying market supply and demand, etc. In this way the syndicate's purpose was served very well as long as trade continued brisk or even fair; but in periods of depression this loose combination went to pieces, the same as in the United States under similar conditions.

The next step was the formation of a stronger organization, the members of which agreed to pool their interests. This really constituted a union of otherwise independent firms or companies, and had a striking parallel in the constitution of the United States. That is, all matters of common interest were attended to by the central authority, corresponding to our federal government, and each member of the union conducted the details peculiar to his own business as he saw fit, just as our States are supreme in the exercise of their own sovereign rights. By bearing this comparison in mind one is aided in understanding what otherwise is apt to seem a very complicated system.

Through the establishment of central bureaus, raw materials were bought for all of the members of the syndicate and their finished products marketed along the

most highly efficient and economical lines. The executive officials, both directly and through suitable representatives, also attended to a great variety of commercial work, including legal matters of common interest to all. The individual firms and companies included in the syndicate retained, on the other hand, their complete corporate autonomy, divided their net earnings among their own stockholders and managed their own works. When it seemed desirable for them to act independently in buying and selling, after agreement with the executive committee of the syndicate, they were governed accordingly.

From the fact that the works were not under syndicate control, but only their products, it was practicable for a concern manufacturing a number of distinct lines to belong to as many different syndicates. This is a development which has been practically without a parallel in the United States.

Of recent years there have grown up, entirely separate from the above, syndicates of a different class, which correspond very closely to what is popularly termed in the United States a "trust." These take over the entire properties of constituent companies, issue new stock and consolidate the management in every detail under the absolute control of a central authority. Such syndicates pertain mostly to banking, real estate, etc., and for the purposes of this article they will not be considered further.

### Methods of Organization and Operation

The developments of greatest interest to Americans have been in connection with the industrial syndicates, whose organization has continued to the present time practically as above described. While many of the syndicates are national in their scope, most are sectional or district organizations. There are, however, many "wheels within wheels," and all of them work in great harmony, considering the inevitable conflict of interests.

Syndicates come under the same general laws of incorporation as any other corporate bodies. The writer is informed that an imperial charter is not required, even for an association national in its scope, the only obligation being the filing of the contract or protocol which forms the basis of its organization, with such other formalities as apply to all corporate business. These details are attended to in the locality where the syndicate's central office is opened, and every such office must be registered in the nearest court having jurisdiction over such matters.

Following organization the country or section affected is divided into zones, one map being made for raw materials and another for finished products. Then the experts of the syndicate visit the works of its members, as well as the sources of raw material, record the geographical location of each, its productive capacity including equipment, and the particular facilities of each member for a specified character of work. The orders secured henceforth are allotted to the various establishments, according to their situation and capacities, at prices fixed by the best terms the syndicate can make with its customers. For convenience in accounting, the syndicate is considered as buying directly from each member; and the prices are allowed on the basis of a scale which seeks to equalize the advantages or disadvantages of location, capacity, etc., which one member may enjoy or suffer with respect to the others. These are worked out separately for the home market and for export, assignment of the latter trade being to the plants best fitted to handle it, on a strictly proportionate basis. So far as other members might suffer from this arrangement, it is made up to them in domestic business. There is, in every case, the most careful effort to avoid waste, overlapping, delays and unnecessary transportation either of the raw materials or finished products. For example, an order received by a German syndicate of national scope from a customer



in Austria would be placed with works, say, in the Augsburg-Nürnberg district, while another originating in France or England would go to a plant in Westphalia or Rhenish Prussia. The economies which this method of distribution effects in the course of a year are very large.

#### How Export Trade Is Fostered

In the maintenance and increase of production the fostering of export trade has played a prominent part. This has been brought about in two ways, viz: 1. Supplying materials to manufacturers at lower rates when they are to be used in working up articles for export. 2. Payment of bounties to auxiliary industries, these allowances being made as far as possible to members of the same or affiliated syndicates, but frequently to outsiders. There is also co-operation in this respect between independent syndicates. For example, the coal syndicates pay bounties to members of the pig iron syndicates who do not own collieries and use a large part of the coal mined. This was recently fixed for the Rheinland-Westphalia district, until June 30, at  $1\frac{1}{2}$  marks, or 35 cents, per ton of iron. The pig iron syndicates in turn pay a bounty (in the form of a lower price for raw material) to members of the steel syndicates, and these pass it along to the numerous manufacturers of machinery, welded and seamless drawn steel tubing, structural shapes, bridge material and other finished products who do any export business. The systems noted so far overlap that they can be said to constitute one. These export premiums or allowances vary according to the fluctuations of the home and foreign markets, the idea being to make the difference great enough to insure as full operation as possible of German plants, and the maintenance of a reasonable level of prices in all of the lines directly affected.

Where the syndicate exports its own commodities the procedure is a little different. To illustrate: When the producers of bar iron organized they contributed to an export fund a certain amount on each ton marketed at home, and from this a much larger sum was paid as a premium to each exporter for every ton shipped abroad. The almost immediate result was restoration, to a reasonable productive basis, of the domestic trade, which had been in a state of demoralization as a result of the overplus withdrawn from the home market.

How successful this policy has been is attested by the statements of competitors. In an address delivered before the British Iron Trade Association in London, Sir Charles McLaren called attention to the fact that Germany since 1908 has had the largest percentage of increase in steel production of any country in the world. German, he stated, has no sources of cheap production that Great Britain does not possess, and yet the latter has been outstripped. He could not help thinking that it might be very profitable to concentrate attention upon the question of production and sale by syndicates.

#### Home Feeling on Syndicate Policies

*Export trade is generally taken by the German syndicates at a lower figure than the home market will support; and sometimes, to avoid overproduction, the syndicated products are sold abroad at less than their cost would be if based on the smaller volume of output which curtailment would bring. This, of course, leads to some dissatisfaction at home from those who have not given the subject full consideration. Also, it is a source of grievance to the finishing industries that, by exporting raw or partially shaped material at much less than the prices made to the latter, various syndicates are helping to build up competition for them in nearby nations, so that one home industry is simply benefited at the expense of another. As a whole, however, the syndicate policies meet with very general approval from manufacturers in all industries and the tendency is towards further combinations along the same lines.*

The attitude of the government also is favorable, and a number of syndicates whose operations are based on the natural resources of the country, as in mining, have been formed practically under its auspices. In fact, it has recently been reported that the output of the mines owned by the Prussian Government in the Rheinland and Silesia will henceforth be marketed entirely through the coal syndicates.

Coincident with the anti-trust agitations in the United States, at various times, attempts have been made in Ger-

many to inaugurate special legislation for the control of syndicates; but no such measures have ever been seriously considered, because unsupported by public opinion.

The syndicates, also, have been very careful not to commit any illegal acts—for which in Germany they would be certainly and swiftly punished—nor to arouse the hostility of the ultimate consumer by unwarrantably raising prices. Instead, they have been able to show him the benefits noted in the opening paragraphs of this article and to arouse his patriotic pride in the expansion of German industries. Above all, however, they have done much to provide steady employment, and the recognition of this fact has spread among all classes of the population.

#### Prices Not Unreasonable

The effect of syndicate operation has been to maintain prices at generally uniform levels; but, owing to world-wide economic conditions incapable of control, this has seldom done more than insure a fair working profit. As an example of this I may cite the case of cement. Notwithstanding the fact that its production has been under the complete regulation, in Germany, of syndicates representing nearly 100 independent plants, the price has been gradually lowered to consumers, until it is now fully 50 per cent. lower than it was a decade ago. Modern methods have brought about lower manufacturing costs, and if the German producers had held their cement at figures unwarrantably high the market would have been flooded with offerings from England and Belgium. In this an important factor there is the low cost of transportation of bulk materials on the navigable rivers and canals which penetrate every nook and corner of the German Empire. These also enable them to get exports out at low cost, putting the greater number of manufacturing plants in almost the position of being directly on the seaboard.

There are certain exceptions to the condition noted, especially various chemical syndicates, which have obtained almost complete monopolies in certain fields of production. In recent years, as the writer is informed, they have paid dividends as high as 33 per cent. These, however, are really close combinations, mainly international in their scope, and include English, French, Belgian, Austrian and American capital, with works in each of the countries represented, so they can hardly be classed with the syndicates above described. The so-called "cyanide trust" is a prominent example. One almost purely German is the potash syndicate, in which the government has taken a hand, as brought out during the recent controversy with American companies interested in the output of certain of the mines.

#### Competition Not Throttled

The membership of syndicates is subject to more or less shifting about, as the agreements which form the bases of their organization expire, these being ordinarily made for a definite period. Such a crisis has been reported as confronting the Steel Works Union, some of whose members have increased their capacities and are reported to be dissatisfied with the allotments made them. If so, there is nothing to prevent them from withdrawing and no serious disturbance of existing conditions is likely to result. But these threats of withdrawal are well understood and are generally the preliminaries of compromise. Between the syndicates and others there is very much the same relation that exists in this country between the Steel Corporation and companies engaged in the manufacture of similar products. There is no attempt to throttle competition, "live and let live" being the general policy. This situation is strengthened by the fact that, as above explained, one concern may belong to a number of different syndicates.

#### Banking Influences and Syndicates

When a German wants to engage in a new line of business there is no bar to his doing so, any more than in this country, so far as the syndicates are concerned. He must merely have the necessary capital and ability. With respect to credit extension, however, the established concern, whether belonging to a syndicate or not, has decidedly the advantage over any newcomer, owing to the nature of the banking system. In Germany, before a large loan is made to a manufacturer, for example, the banker investigates very carefully the resources and possibilities of the business. Then, in extending the credit, he usually secures representation on the manufacturing company's

board. Thereafter, the bank's representative will attend all meetings of the board, at which the company's business must be gone over in detail, and any departure from conservative business practice is at once checked, unless some good reason can be shown for it. The local banks being usually branches of a powerful affiliated group of central banks, a large part of the resources of the empire is behind practically every such loan, and the effect has been stability in business to an extent that is unusual in the United States. These methods have unquestionably aided in the formation and support of syndicates and will promote them in future. They have brought about, in recent years, the investment of much new capital.

On American soil the syndicate system would probably not flourish, but there are many of its features that might be copied to advantage; and the basic idea of providing for the steady maintenance and progressive upbuilding of home industries is one that should be encouraged by the government in every possible way, instead of being antagonized. Nor should the fact be ignored that in Germany the syndicates are already firmly established, practically under government protection, and that they are in a position to exert a very great effect on production in this country if the barriers are removed.

## Workmen's Compensation

### How Constitutional Objections Have Been Met by Various States

The counsel for a large corporation, who has specialized on employers' liability, writes interestingly to *The Iron Age* on the present status of workmen's compensation acts in the United States, as to their constitutionality. The point is one that has befogged the understanding of many interested employers. The letter, which includes the opinion of the Federal Workmen's Compensation Commission, clearly elucidates the principles involved, and is as follows:

"The principle of workmen's compensation is that work accidents are practically unavoidable and that the loss occasioned by them should be quickly paid and equitably distributed so that in the last instance the community shall pay the bill. This principle has been worked out in a variety of ways in some 20 foreign countries and in some 10 States of the United States. Apparently it is possible to work out the principle in a constitutional as well as in an unconstitutional way.

"The State of Washington substituted it in place of all other liabilities between master and servant and secured the payment of the indemnity by a State insurance plan and the Supreme Court of Washington held this was constitutional. Wisconsin repealed certain of the common law defenses and allowed (in effect thereby drove) the employer to elect a compensation scheme, and did nothing about the securing of the payment of the indemnity, and the Wisconsin court held that this was constitutional. Massachusetts adopted the same elective device but established a mutual insurance company to which each employer should become a subscriber, and the Massachusetts court held it constitutional.

"Please observe that in each one of these statutes either the new law was made compulsory on employers and employees, and existing remedies taken away, or it was made elective so that either side could choose whether to come under the compensation act or stay out with certain defenses removed.

#### Defects in the Montana and New York Laws

"Montana adopted the compensation principle in mining, and perhaps certain other hazardous industries, but provided that the employee when injured should have both the present rights at common law, or, if he chose, the rights under the compensation act. The Montana court held that the law was valid in all other respects but that this provision was unconstitutional.

"The New York statute applied to certain hazardous employments, and allowed the employee after his injury to elect whether he would hold the employer liable at common law or under the employers' liability act, or whether he would hold him liable under the compensation act, and the New York Court of Appeals in the Ives case held this statute unconstitutional.

"I believe that the decisions in the Montana and the New York cases would have been rendered by any court in the country which had to pass upon statutes phrased as were those acts. I believe that both those courts would have sustained the constitutionality of the Wisconsin or the Massachusetts statute. I am not quite so sure about the Washington statute, because state insurance is a pretty radical departure.

#### Why the New York Law Was Upset

"The best explanation of the New York decision that I have seen is found in President Taft's message to Congress transmitting under date of February 20, 1912, the report of the Federal Workmen's Compensation Commission applied to interstate railroads. Senator Sutherland was the chairman of this commission. It was an able commission and had before it perhaps the most complete data, briefs, etc., of any of the commissions studying the statute. Their explanation of the Ives case is found on pages 50 and 63, as follows:

"It may be said in passing that the law of New York held invalid in the case of Ives vs. South Buffalo Railroad Company, 201 New York 271, had the effect of making the employer liable to pay compensation for the injuries resulting from inherent or trade risks irrespective of negligence, while at the same time continuing his liability at the election of the employee for injuries resulting from negligence as at common law. In other words there was superadded to the burdens of the employer arising from the common law liability for fault, a further burden of liability without fault.

"To provide, however, for the election between the old liability and the new is in reality to place two diverse principles at the foundation of the law. Such was the law of New York involved in the Ives case and the court might well have been justified in holding it unconstitutional for this reason, since the effect of it is not to create a single liability irrespective of fault, but a double liability proceeding on exactly contrary principles, . . . where the employer is made responsible for the payment of indefinite damages in case of his negligence, and the other where he is made absolutely responsible for definite compensation where he is without any fault whatsoever.

"It may well be argued that legislation which puts upon the employer this naked burden irrespective of fault without the compensating circumstance of being relieved in any other direction is so arbitrary and unreasonable as to fall within the inhibition of the Fifth Amendment against the deprivation of property without due process of law."

### New Iron and Steel Warehouse in New York City

The Manhattan Rolling Mill, the corporation recently operating the only rolling mill in New York City, has abandoned the manufacture of bar iron after a record of 50 years and has engaged in the business of jobbing iron and steel at 315 to 325 East Ninety-seventh street, New York. The company has secured a convenient location from which all parts of the city and outlying districts can easily be supplied. Commodious quarters are occupied, covering about eight city lots. The products to be handled comprise strictly building trade requirements, such as iron and steel bars, beams, channels, angles, sheets, plates, twisted bars and bridge irons. Facilities have been installed for cutting to lengths and fabricating, all machinery being operated by electric power. Frank D. Cadmus is secretary, treasurer and general manager. He started in the iron business with John Leonard 25 years ago and is therefore thoroughly familiar with the conditions obtaining in the branch of business now undertaken.

No. 3 Swede furnace of the Heckscher Department of the Alan Wood Iron & Steel Company, at Swedeland, Pa., was blown in April 25. It will make basic iron, hot metal being transferred to the Ivy Rock plant of the Alan Wood Company. The company announces that plans are being prepared by Julian Kennedy for a new mill with rolls 30 x 84 in., to be erected at the Ivy Rock plant. When this is completed, it will enable the company to increase its line of blue annealed plates in larger sizes and of heavier gauge than can be made at its Schuylkill Iron Works at Conshohocken.



## Arrangements for Testing Materials Congress

The Organizing Committee of the Sixth Congress of the International Association for Testing Materials makes the following provisional announcement regarding details of the Congress, which will be held in the Engineering Societies Building, 29 West Thirty-ninth street, New York, the first week of September. On Monday of that week, September 2, the headquarters will be open all day for registration. In the evening there will be an informal reception under the joint auspices of the American Society for Testing Materials, the American Institute of Electrical Engineers, the American Society of Mechanical Engineers and the American Institute of Mining Engineers.

On Tuesday morning, at 10 o'clock, there will be an address of welcome by the acting president of the International Association, Dr. Henry M. Howe, and by National, State and municipal officials. The various sections will then arrange for their sessions in their respective section rooms. The proceedings will be conducted in English, German and French, with the aid of interpreters. The section sessions will convene at 2 p. m. and continue until 5 p. m.

On Wednesday section sessions will take place from 10 to 12 a. m. The afternoon and early evening will be occupied by an excursion to West Point.

On Thursday there will be section sessions beginning at 10 a. m. and 2 p. m. In the evening there will be a reception tendered by the American Society of Civil Engineers in its building at 220 West Fifty-seventh street. Owing to the limited capacity of the building this reception will be restricted to the foreign members and delegates and to a number not exceeding 400.

On Friday there will be section sessions in the morning and early afternoon, and an evening excursion down the harbor.

On Saturday morning at 10 o'clock there will be a general session at which the sections will report, and resolutions upon their recommendations will be passed. The Congress will adjourn at noon. The evening is reserved for later arrangements.

During the Congress ample opportunity is to be offered to see the many points of interest about the city and its environs. The ladies in attendance will find themselves in the hands of a special committee.

### Post-Congress Excursions

For those who desire to see something of the country and its industrial development there will be an excursion in a special hotel train on which the party will live during the trip. The train will leave in two sections, one on Saturday night, going to Atlantic City, where Sunday will be spent; the other on Sunday afternoon for those who would prefer to spend more time in New York City. These sections will reach Washington together on Monday morning, where a sufficient stay will be made to visit the Government buildings, special opportunity being given to inspect the Bureau of Standards and the testing laboratories of the Army and Navy. From there the party will go to Pittsburgh, where there will be given a demonstration by the Bureau of Mine Explosives. Every facility is to be extended by the coal, steel, electric and cement interests to study the latest processes in their respective fields. From there the excursion will continue to Buffalo and Niagara Falls, the latter offering a specially conducted trip through the gorge of the Niagara River in the evening.

The return trip to New York will be via the Lehigh Valley Railroad. Stops will be made en route to visit the works of the cement industry, and the ordnance and structural works of the Bethlehem Steel Company, all of which are located along this line. The excursion train will return to New York City in time for foreign visitors to take the steamers sailing on Saturday, September 14, if they so desire. Opportunity is to be extended at Pittsburgh to those who wish to go further west to visit special industrial establishments, such as the Illinois Steel Company's plant of the United States Steel Corporation at Gary, Ill., or other features of interest.

The Congress fee is \$5 for members and delegates. For ladies and guests who wish to enjoy the privileges of the Congress outside of taking part in its deliberations the fee will be \$3. The cost of the excursion to Washington, Pittsburgh, Buffalo and the Lehigh Valley will be \$50.

All who contemplate taking part in the Congress and accompanying the excursions should send in their names by July 1, probably to H. F. J. Porter, secretary of the organizing committee, 1 Madison avenue, New York City.

It is urged that discussion be prepared in advance when references, figures, and similar material are available for citation. Discussion prepared in advance and submitted in writing will have precedence over impromptu discussion. An advance distribution of the printed papers will give opportunity for preparing discussion. For earlier information, however, short abstracts of the foreign papers are being obtained.

Abstracts are now available for foreign papers in part as follows:

- Physical Tests of Special Steels for Naval Use.
- Investigations of Bearing Metals for Machines.
- Practical Determination of the Viscosity of Oils.
- Relation Between the Bending Force and the Actual Strain or Hardness.
- Differences Between Tenacious and Malleable Material in Regard to Change of Form.
- Methods of Testing Cast-Iron.
- Nature of the Welding of Iron and Steel and Practical Applications.
- The Nature of Autogenous Welding of Iron and Steel, and Practical Applications.
- Changes in the Physical Properties and Structure of Tool Steel when Heated from 600 deg. to 1000 deg. C.
- Testing Consignments of Steel and Iron on the Basis of their Chemical Composition.
- Observations on the Application to Cast-Iron of the Test Methods Commonly Applied to the Other Metals.
- Fatigue of Metals.
- Electric Resistivity of Special Steels.

## Two Important Departures by the American Sheet & Tin Plate Company

The announcement by the American Sheet & Tin Plate Company that in the future it would sell its roofing products on a per pound basis, instead of by area as heretofore, has been followed by a further notice that in the future all its roofing plate will be made from strictly high grade copper-bearing open-hearth steel. This announcement, it is stated, is the result of endurance tests which have been conducted in different parts of the country under varying conditions.

The American Sheet & Tin Plate Company claims that while the introduction of copper does not directly improve the wearing quality of steel, except as an acid resistant, it has been conclusively proved that, when added in the proper proportions, the base plate amalgamates with the tin and lead coating more thoroughly, with the natural result of increased durability. It has also been found that material of this character is softer and more ductile, thus overcoming the objection often raised by tanners that theterne plates made today are too stiff to be properly laid.

**Electrical Engineers' Meeting.**—On April 25, 26 and 27, the American Institute of Electrical Engineers in conjunction with the Association of Iron and Steel Electrical Engineers met in the Fort Pitt Hotel, Pittsburgh, under the auspices of the Pittsburgh Section and the Industrial Power Committee of the institute. About 160 were present. The first session, on Thursday morning, was called to order by K. C. Randall, Westinghouse Electric & Mfg. Company, chairman of the Pittsburgh Section. The business sessions lasted all day on Friday and on Saturday until noon. A number of papers were presented. On Thursday evening a smoker was held in the Fort Pitt Hotel. Inspection trips were made to the Homestead Steel Works and other plants in the Pittsburgh district.

The Defiance Machine Works, Defiance, Ohio, is building an erecting shop, 77 x 132 ft., and another shop, 97 x 115 ft., to be used for cleaning castings and to contain the shafting, plate, grinding and blacksmith departments. Both buildings will be of saw-tooth roof construction. This company will not be in the market for any further machinery until the buildings are completed, at which time it will probably rearrange its machinery and add some new tools.

## New Tools and Appliances

*This is essentially a news department for which information is invited*

**Vertical Tappers.**—Two recent products of the Evans Stamping & Plating Company, Taunton, Mass., are a pair of vertical tappers, with automatic stop mechanism which enables them to be set to tap any desired depth. One of these machines is operated by a hand lever and is adapted for gang work and pieces which on account of their size compel the operator to stand when handling them, while the other is operated by a foot lever and has an adjustable belt tightening bracket on the back. Both the machines are equipped with ball thrust bearings, have a range up to  $\frac{1}{4}$  in., and are fitted with chucks to handle taps up to that size. The base of the machine is planed and the  $11\frac{1}{2}$ -in. swing table has a vertical adjustment of 3 in. The clearance between the tap spindle and the column is 6 in. and the net weight of either type of machine is 135 lb.

**Lathe and Grinder Dogs.**—Page-Storms Drop Forge Company, Chicopee, Mass., is manufacturing a drop forged steel grinder dog in five sizes ranging from  $\frac{1}{2}$  to 6 in. This dog is brass lined to prevent marring the work and can be reversed for use in lathes.

**Vacuum Cleaner.**—For renovating the walls of factories prior to whitewashing and various other cleaning purposes, Hanlon & Wilson, Wilkensburg, Pa., is manufacturing a factory vacuum cleaner. The machine, which can be equipped with either a direct or alternating current motor, has ample capacity for all ordinary requirements. The power for operating the motor is secured from the regular factory lighting system.

**Automobile File.**—Liveright Brothers, Philadelphia, Pa., are placing on the market for automobile use a new



type of magneto file. This file is the size of a penknife, the file folding into the handle which has a square hole at one end for use as a gas tank key. The tool is made of very thin material and is employed to file down the aluminum point of the magneto. One of the edges of the blade is used to clean out slots and screw heads.

This tool is only one of a large number which have been brought out by the company and are being marketed under the new trade mark which is reproduced herewith.

**Vibrating Reed Tachometer.**—James G. Biddle, Philadelphia, Pa., is handling a type of vibration tachometer made by Siemens & Halske, Berlin, Germany, in which the indicating part consists of one or more rows of tool steel springs which are firmly supported side by side at one end. A small portion of the free end is bent over at right angles and is enameled so as to be readily visible. In the operation of the tachometer advantage is taken of the fact that there are some slight inequalities in the weight of the revolving part of every machine which results in a certain amount of vibration being set up when they are in motion. The tachometer is mounted on the base or cover of the machine so that it will vibrate in unison with it and the reed which is in tune with the vibrations of the machine is set into violent motion so that it can be readily distinguished from its neighbors. For example, if the machine gives one impulse per revolution with a speed of 1800 r.p.m., that reed would indicate which is adjusted to 1800 vibrations per minute. In this way the instrument indicates the speed of the machine it is attached to accurately and there are no electrical or mechanical connections to become deranged through accident or wear. The special field for which the tachometer is intended is steam turbines, water wheels, centrifugal pumps, electric motors, generators, etc., having speed ranges of from 900 to 8000 r.p.m.

**Automatic Chuck Closer.**—Among the devices recently brought out by the Stark Tool Company, Waltham, Mass., is an automatic chuck closer designed for releasing and binding the work while the lathe is in motion. It

consists of a collar with three inserted jaws, swinging on pivots and with a sleeve on the outside of the collar that can be swung to compress the forward end of these jaws. When this is done the jaws rock and throw the back end against the collar which comes in contact with the draw-in spindle. This draws in the split collet which binds the work, and when the lever is thrown backwards the work is released.

**Magnetic Chucks.**—A flat and a rotary magnetic chuck have been recently developed by the D. & W. Fuse Company, Providence, R. I. The former has a horizontal face and adjustable end and side stops which provide a convenient means for locating and steadying the work on the surface. This type is especially adapted for holding thin stock for grinding flat surfaces. The rotary chuck has been employed for a number of different operations such as the manufacture of ball and roller bearings and the grinding of pistons and piston rings. It is equipped with an auxiliary plate. This plate is used as a jig or a fixture for holding special or irregularly shaped pieces, and it is possible in this way to have one chuck cover a wide range of operations since any number of plates can be used with the one chuck. The ends are machined so that several of them can be lined up end to end for holding long work or for machining a large number of parts in one operation. These chucks are designed for use directly on 115-volt direct-current circuits and where it is desirable to use them on circuits of higher voltages a convenient form of auxiliary resistance is supplied which can be inserted at any point in the circuit. They are both oil and waterproof and are equipped with demagnetizing switches for readily releasing the work. The magnet coils are wound with a special type of wire having an asbestos insulation capable of withstanding a temperature of 400 deg. F. The coil units are interchangeable and they can readily be replaced in case of injury without the necessity of returning the chucks to the factory.

**Hand Miller.**—The Rockford Milling Machine Company, Rockford, Ill., is now equipping its No. 3 hand milling machine with a power longitudinal feed whenever it is desired. The arrangement of the feed mechanism is simple, the power being derived from the rear end of the main spindle, where a three-step cone pulley is mounted. This pulley connects with a lower pulley mounted on the end of a universally jointed shaft, and the motion is carried from this shaft to the work table through gearing. Six feed changes can be secured by reversing the cone pulleys and in addition the machine has the regular combination screw and lever feed. There is no interference between the two feeds and the change from one to the other can be quickly made. It is now possible to use this machine for either horizontal or vertical milling, and it is adapted to a wide range of work by employing special attachments. The longitudinal power feed is 11 in., the transverse feed is 4 in., and there is a vertical movement of  $6\frac{1}{4}$  in. The working surface of the table measures 18 x  $4\frac{1}{4}$  in.

**Drilling and Counterboring Machine.**—A special duplex drilling and counterboring machine has been developed by the F. E. Wells & Son Company, Greenfield, Mass., which operates on both sides of the work simultaneously by opposed horizontal spindles. One of these carries a combination drill and counterbore while the other is equipped with a counterbore only so that a hole is drilled through the work and counterbored on each side. The two spindles are moved toward each other by a foot treadle which is connected with them by chains passing over sheaves and attached to arms connecting with the spindles. The torsional strain of the spindles when the drilling and counterboring tools are at work is taken up by a guide rod at the rear of the machine and stops are provided for limiting the depths of the drilling and counterboring. All that is necessary for the operator to do is to hold the work in position and press down on the treadle for feeding the spindles. A drip tank is provided for supplying a cooling compound to the tools when steel or other metals which require cooling are being machined.

**Gasoline Torch.**—A hot blast gasoline torch, which is made of heavy brass tubing, has been developed by the Turner Brass Works, Sycamore, Ill. A very hot blast flame which is easily controlled by the gasoline valve is



produced. The burner is at one end of the torch and the gasoline valve and the pressure pump at the other. A tube about 5 ft. long forms the body of the torch and contains the gasoline that is delivered to the burner. A controlling valve inside the tube regulates the flow of fuel so that the torch can be used in any position. Air pressure is supplied in the usual way.

**Polishing Jack.**—The F. E. Wells & Son Company, Greenfield, Mass., has recently placed on the market a new type of polishing stand or jack. The machine was first built for the company's use, but was so satisfactory that it is now being manufactured and sold to the general public. It is driven from below the floor, an arrangement which prevents accidents from the driving belt and at the same time the mechanism is self-contained. The inclosed construction which is made possible through this arrangement serves to protect the bearings from dust. Power is transmitted from a belt running over the driving pulley beneath the floor and another pulley on the main shaft of the machine. Normally this belt runs slack and the polishing shaft is at rest. Pressing a hand lever at the side of the column starts the machine and this movement brings an idler pulley into play, forcing it against the driving belt and tightening it. The pulley is kept in contact with the belt by the engagement of a pin on the lever with a projection on the machine frame. As soon as the idler pulley is swung away from the belt, the spindle is quickly stopped by a brake that is automatically applied by the backward movement of the idler pulley. A special shaft for carrying two wheels and a swinging arm with a table for disk grinding can also be furnished if desired.

**Spot Welder.**—The National Electric Welder Company, Warren, Ohio, has recently brought out an electric spot welder, capable of welding to the center of a 48-in. sheet. The machine has a regulating coil which gives eight different voltages at the welding point, the variations being indicated by a dial on the side of the machine. It is equipped with an automatic switch and it is impossible to turn on the operating current until the welding points are brought firmly into contact with the metal. As soon as the pressure on the points is removed, the switch is immediately opened, thus preventing burning of the work or the destroying of the copper welding points, which are kept cool by a continuous stream of water flowing through them. Either a hand lever or a foot treadle can be used for operating the machine and the former can be quickly removed if desired. The switch employed is a new type which opens both sides of the primary circuit in two places, an arrangement which avoids excessive arcing when the circuit is interrupted. Two pieces of  $\frac{3}{4}$ -in. boiler plate can be welded and sheet steel  $\frac{1}{16}$  in. thick can be welded at the rate of 30 welds per minute, while steel stock half as thick can be welded at a slightly lower rate. The cost of operation is said to be 10 cents per thousand welds in No. 16 gauge iron or steel with the current costing 4 cents per kilowatt-hour.

## Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

**RESPONSIBILITY FOR INJURY TO MINOR EMPLOYEE.**—In determining whether a minor who sues his employer for personal injury received while at work was guilty of contributory negligence, barring his right to recover, the minor's age should be considered. (United States Circuit Court of Appeals, Second Circuit, Mann vs. Otis Elevator Company, 191 Federal Reporter 716.)

**EFFECT OF BUYER'S FAILURE TO READ CONTRACT.**—Failure of a buyer of goods to read the contract of sale before signing it does not release him from its terms unless the seller fraudulently misleads him as to the contents of the instrument. (Georgia Court of Appeals, Patapasco Shoe Company vs. Bankston, 74 Southeastern Reporter 60.)

**TIME FOR PERFORMANCE OF CONTRACT.**—A manufacturer's agreement to furnish the nuts, bolts, etc., for a building covering 22 acres, to be delivered on the buyer's lists of material required, furnished at least 30 days prior to the time the material should be "required," gave the manufacturer 30 days in which to provide the material before it was needed. Hence, failure to deliver on 30 days' notice did not constitute a breach, if the material was not actually needed at expiration of that time. (Missouri Supreme

Court, Moran Bolt & Nut Company vs. Caldwell, 144 Southwestern Reporter 472.)

**LIABILITY UNDER OPTION CONTRACT.**—If a manufacturer is given an option to retain pump patterns, core boxes, and drawings lent him by a pump company, by either paying a royalty or their appraised value, and he retains them but fails to pay in either way, or to state in which way he desires to pay, he becomes liable for their appraised value. (Missouri Supreme Court, Hooker Steam Pump Company vs. Buss, 144 Southwestern Reporter 419.)

**LEGALITY OF COERCION OF MANUFACTURER.**—A campaign by jobbers among themselves to compel a manufacturer to grant them more favorable terms for marketing his goods does not constitute an unlawful conspiracy to injure the manufacturer's business, no boycott against sale of his product in the open market being threatened. (New York Supreme Court, Monroe County, Shinola Company vs. The House of Krieg, 133 New York Supplement 1015.)

**VALIDITY OF COMPOSITION AGREEMENT.**—While a composition with creditors, to be valid, need not include all the debtor's creditors, if other creditors were induced to settle their claims under belief that plaintiff was settling upon the same terms, a secret arrangement by plaintiff with the debtor, whereby plaintiff obtained an advantage over the other creditors, would be such fraud as would vitiate the whole composition agreement, invalidating notes given to consummate the agreement. (Indiana Appellate Court, Atlas Engine Works vs. First National Bank, 97 Northwestern Reporter 952.)

**WHEN BREACH OF CONTRACT NOT AVAILABLE.**—One who has broken a contract cannot recover on account of the other party's subsequent breach. (Indiana Appellate Court, Cullen-Friestadt Company vs. Turley, 97 Northwestern Reporter 946.)

**VALIDITY OF ARKANSAS NOTES.**—Under the statutes of Arkansas, a note taken on account of the price of a patented machine is void unless executed on a printed form showing on its face that it was given for a patented machine, unless the sale is made by a merchant or dealer in the regular course of business. (Arkansas Supreme Court, C. B. Ensign & Co. vs. Coffelt, 145 Southwestern Reporter 231.)

**RESPONSIBILITY OF CORPORATE OFFICERS.**—While, generally, an officer of a corporation is not individually liable for its negligent acts, if he actively promotes the manufacture and sale of a dangerous commodity under such circumstances as to make the corporation liable for negligent injury to a customer, he can be held jointly liable for the injury. (Michigan Supreme Court, Wines vs. Crosby & Co., 135 Northwestern Reporter 96.)

**POWERS OF CORPORATIONS.**—A corporation can exercise only such powers as are expressly granted by its charter, or as are necessarily incident to those expressly given. Its right to do business in a State other than where it was organized is not absolute but depends upon the laws of the foreign State. (California District Court of Appeal, Reed Orchard Company vs. Superior Court of Yolo County, 121 Pacific Reporter 1011.)

**STOCKHOLDER'S RIGHT TO EARNINGS.**—A stockholder has no fixed claim against the corporation for a share of its earnings until a dividend is declared. (Iowa Supreme Court, Lauman vs. Foster, 135 Northwestern Reporter 14.)

**CORPORATE RIGHTS IN TRADE-NAMES.**—Withdrawal from a corporation of a stockholder whose name is used in a trade-name does not defeat the company's exclusive right to use the name, unless the withdrawing stockholder so qualifies his subsequent use of the name as to avoid deceiving the public. (Washington Supreme Court, Wright Restaurant Company vs. Seattle Restaurant Company, 122 Pacific Reporter 348.)

**LAWS AS PART OF CONTRACT.**—So far as applicable, all existing laws become part of a contract, whether expressed in it or not. (Massachusetts Supreme Judicial Court, Rosenbush vs. Bernheimer, 97 Northeastern Reporter 984.)

**RIGHTS OF INDORSEE OF CHECK.**—That one takes a check by indorsement after lapse of a reasonable time for its presentment places upon him the risk of the bank failing, but he is not thereby deprived of his status as an innocent holder, as to any claim of the drawer against the original payee. (Indiana Supreme Court, Johnson vs. Harrison, 97 Northeastern Reporter 930.)

**RIGHT TO WITHDRAW SUBSCRIPTION TO FUND.**—One who has subscribed to a commercial club fund to provide bonuses for the location of additional factories in the town was not entitled to withdraw the subscription where others had acted on the faith of it, though no bonus had yet been paid or agreed to be paid. (Indiana Appellate Court, Brown vs. Marion Commercial Club, 97 Northeastern Reporter 958.)

**REMEDIES OF SELLER AGAINST BUYER.**—Where goods contracted for are tendered by the seller to the buyer, but

the latter refuses to receive them, the seller, if not at fault, may pursue any one of three remedies: He can store the goods for the buyer and recover the entire price; or he can resell the property and recover the difference between the contract price and the price obtained on the resale; or he can retain the goods and recover the difference between the market value at the time and place of delivery agreed upon and the agreed price. (United States Circuit Court, District of Nevada, Engineering Works Company vs. Mohawk Consolidated Leasing Company, 193 Federal Reporter 745.)

**SELLER'S RIGHT TO RECOVER PRICE.**—Notwithstanding the fact that an order for machinery was countermanded while the seller still had possession of the machinery, and the buyer refused to accept and pay for it, or to execute his notes therefor as agreed, and the agreement provided that title should remain in the seller until payment of the price should be made or satisfactorily secured, the seller is entitled to recover the price, holding the machinery subject to the buyer's order. (Iowa Supreme Court, Port Huron Machinery Company vs. Hurto, 135 Northwestern Reporter 31.)

**RIGHT OF BUYER AS TO INFERIOR GOODS.**—Retention by a buyer of goods inferior to the sample by which they were sold constitutes a ratification of the contract, subject to his right to claim a deduction from the price. (Kansas City Court of Appeals, Federal Discount Company vs. Reid, 144 Southwestern Reporter 891.)

**SHIPMENTS TO SELLER'S ORDER.**—That a bill of lading to the shipper's order bears an indorsement directing delivery to the buyer does not divest the shipper's title to the freight. (Iowa Supreme Court, Reed vs. Racine Boat Company, 134 Northwestern Reporter 1069.)

**RECOVERY OF GOODS BY SELLER.**—That the buyer has become bankrupt or has made an assignment for the benefit of his creditors does not prevent a seller of goods from recovering them, on account of the buyer's fraud in inducing extension of credit on a false representation that he was solvent. (Tennessee Supreme Court, Richardson vs. Vick, 145 Southwestern Reporter 174.)

**RIGHTS OF STOCKHOLDERS.**—A stockholder subject to assessment for the benefit of corporate creditors is not entitled to off-set a claim against the corporation. (New Jersey Court of Chancery, Holcombe vs. Trenton White City Company, 82 Atlantic Reporter 618.)

**RIGHT TO ENJOIN TRADE CIRCULAR.**—Issuance of a trade circular by one sued for infringement of a patent, stating that his patent is not an infringement, and that plaintiff's patent is void, and containing cuts of prior devices claimed to anticipate plaintiff's patent, is subject to injunction as an improper attempt to influence the trade in advance of the court's decision. (United States Circuit Court, Eastern District of New York, Lovell-McConnell Mfg. Company vs. Automobile Supply Mfg. Company, 193 Federal Reporter 658.)

**FORFEITURE OF FIRE INSURANCE.**—Right to recover on fire insurance is lost by failure to substantially comply with a provision in the policy requiring insured to keep his books and an itemized inventory in a fireproof safe, regardless of any innocence in failing to comply with the requirement. (Virginia Supreme Court of Appeals, Scottish Union & National Insurance Company vs. Virginia Shirt Company, 74 Southeastern Reporter 228.)

**RESPONSIBILITY FOR LOSS OF FREIGHT.**—A railroad company is not liable for freight lost in an unprecedented flood, or through other "act of God," unless the loss would not have resulted except for negligence of the company. (South Carolina Supreme Court, Ferguson vs. Southern Railway Company, 74 Southeastern Reporter 129.)

**RESPONSIBILITY FOR CHAUFFEUR'S NEGLIGENCE.**—An automobile owner is not responsible for a collision negligently caused by his chauffeur, while using the car for his own personal convenience or that of a co-employee in violation of general orders and in disregard of direction to take it to the garage. (Rhode Island Supreme Court, Colwell vs. Aetna Bottle & Stopper Company, 82 Atlantic Reporter 388.)

**INJURY TO WORKMAN AT DERRICK.**—A workman assumed the risk of being injured through placing himself between the swinging arm of a derrick and a load about to be moved by it; he being experienced in the operation of derricks. (New York Supreme Court, First Appellate Division, Kearney vs. Hanlien, 134 New York Supplement 9.)

**NECESSITY FOR HANDRAILS ON FACTORY STAIRWAYS.**—At common law, but not under the statutes of Michigan, an employee in a factory assumes the risk of being injured through absence of a handrail on an open stairway. (Michigan Supreme Court, Davis vs. Buss Machine Works, 135 Northwestern Reporter 303.)

**DUTY TO WARN INEXPERIENCED EMPLOYEES.**—An employer is liable for injury to an inexperienced workman 17 or 18 years old, resulting from the former's failure to warn him against a danger attending his work in cleaning a machine. (Virginia Supreme Court of Appeals, United States Leather Company vs. Showalter, 74 Southeastern Reporter 400.)

## Trade Publications

**Indicating Hot Well.**—Wheeler Condenser & Engineering Company, Carteret, N. J. Bulletin No. 110. Concerned with a recently developed indicating hot well which was illustrated in *The Iron Age*, April 18, 1912. This well is intended for use with the company's condenser, being attached directly beneath it, and furnishes a means for measuring the steam consumed by a turbine or engine. The hot well is divided into two parts and the condensate is received at the left end and flows through an orifice in the dividing wall to the hot well pump suction. A scale is mounted on the outside of the hot well and it is calibrated to read directly in pounds of steam per hour.

**Pumps and Receivers.**—Deane Steam Pump Company, Holyoke, Mass. Catalogue D-3425. Presents in a brief and compact form the several types of automatic pumps and receivers which are being manufactured by this company. Ordinarily this class of machinery is designed to drain heating systems and machinery which depend upon a free circulation of steam for their satisfactory and efficient operation automatically. In addition the hot water of condensation drawn from these systems is pumped back into the boilers with no loss of heat, thus introducing a supply of feed water at a temperature that could not be secured otherwise without the use of a feed water heater. The pumps illustrated include piston and outside packed double plunger patterns of an automatic steam duplex feed pump and receiver, a triplex vertical double-acting power pump and receiver and also triplex vertical single and double-acting power pumps. All of these are illustrated and briefly described and condensed specification tables are included.

**Helve Hammer.**—West Tire Setter Company, Rochester, N. Y. Pamphlet. Calls attention to the various styles of Rochester helve hammer. These hammers are made in six different sizes, and as the dies can be placed either lengthwise or transversely a large number of machines are available. The construction of the hammer is described at length and the text is supplemented by illustrations of the various hammers.

**Roofing Tin.**—N. & G. Taylor Company, Philadelphia, Pa. April numbers of the company's house organs Roofing Tin and the Arrow. One of the especially interesting features about the former is the reproduction of the monument marking the center of population of the United States. Ordinarily these monuments are located in isolated places, but in this instance the spot is located in front of a factory belonging to Showers Bros. Company, Bloomington, Ind., and misses a large Taylor tin roof by about 2 ft. In the other publication there are views showing how a tin roof checks a fire as well as illustrations and brief specifications of the various brands.

**Wood Working Machinery.**—R. E. Kidder, 35 Hermon street, Worcester, Mass. Several circulars. Deal with a line of wood working machinery which includes boring machines, circular sawing machines with stationary and tilting tables and a universal sawing machine. All of these tools are illustrated and briefly described. An illustrated description of one of the boring machines appeared in *The Iron Age*, December 7, 1911.

**Milling Machines.**—Kearney & Trecker Company, Milwaukee, Wis. Catalogue No. 18. Size, 6 x 9 in.; pages, 80. Illustrates and describes the Milwaukee line of milling machines. After a brief historical introduction, the points considered in the design of these machines are taken up and discussed at some length, the text being supplemented by numerous engravings. The various styles of machines are listed with engravings and brief specifications on the facing pages. Mention is made of the various attachments which can be furnished for these machines and instructions for operating them complete the catalogue. Illustrated descriptions of the company's No. 1½B miller and the universal slotting attachment which can be supplied in three different sizes appeared in *The Iron Age*, February 12, 1912, and March 10, 1911, respectively.

**Raw Hide Pinions.**—New Process Raw Hide Company, 500 Plum street, Syracuse, N. Y. Pamphlet. Concerned with the line of New Process noiseless pinions and accurately cut metal gears manufactured by this company. All of the different types of pinions and gears are illustrated and a complete list of the raw hide pinion blanks is given. A partial list of users completes the pamphlet.

**Engines.**—American Engine Company, Bound Brook, N. J. Booklet entitled "A Story Boiled Down." Covers in a series of pictures the advantages of the American-Ball angle compound engine. These illustrate the angle cylinder arrangement, the lubricating system, the valve gear, the governor, the small amount of floor space required, the absence of pounding, unbalanced forces and vibration and how the engines are used in isolated plants.

**Smoke Preventer.**—Furnace Gas Consumer Company, Matteawan, N. Y. Pamphlet entitled "Smokeless Chimneys." Describes



the Furnace gas consumer which was illustrated in *The Iron Age*, Apr. 11, 1912. This device consists of a bank of fire clay tubes installed in the space back of the bridge wall underneath the boiler, and it is claimed that they become heated to such an extent that they serve to reheat the distilled gases and air so that when the two mingle in the space back of the tubes complete combustion takes place before the gases again strike the cold surface of the boiler and there is perfect combustion without the formation of smoke or soot. Other advantages claimed for the device are that its use makes it possible to secure perfect combustion with a smaller excess amount of air and that the heat absorbing capacity of the boiler is increased due to the increased absorption by radiation, the white hot tubes radiating heat to the boiler almost as rapidly as the incandescent fuel bed does, therefore leaving less heat absorption by convection to be performed by the flues.

**Boiler Braces.**—Cincinnati Iron & Steel Company, Cincinnati, Ohio. Folder. Contains a new price list of the various sizes of Cisco weldless steel boiler braces. These braces are made in a number of different lengths from 24 to 108 in. for body diameters of 1½, 1 3/16 and 1¼ in. They are heavily reinforced with a fillet at the end. In addition to listing the braces for each size of body, the dimensions of the shell and the head ends and the weights are given.

**Crane Motors, Controllers and Brakes.**—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Three leaflets, Nos. 2446 and 2447 describe and illustrate two types of electrically-operated brakes for direct and alternating current hoist motors. The type QK which is the one covered in the former leaflet is small and compact and is entirely inclosed with no exposed moving parts. The type SP brake which is built in sizes of from 5 to 200 hp. although designed especially for mill and crane service is also suitable for use with any direct-current motor. This brake is weatherproof and will withstand very severe service. A diagram of the principle upon which they operate is included. No. 2449 describes two types of hand-operated controllers which are built in sizes ranging from ½ to 7½ hp. for light crane and hoist service.

**Punches, Shears, Bending Rolls and Riveters.**—George Whiting Company, Chicago, Ill. Catalogue No. 2. Size, 4¼ x 8½ in.; pages, 64. Describes a line of punches, shears, bending rolls and belt power riveters for use in bridge, boiler, structural and sheet metal work, railroad shops, rolling mills and ship yards. The first four pages are devoted to the standard specifications according to which this company builds its machines and the remainder of the catalogue is given over to illustrations of the various types, each illustration being accompanied by a brief description and table of specifications.

**Motors.**—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Two leaflets. The first, No. 2409, covers a line of self-starting synchronous motors ranging in capacity from 90 to 1500 hp. and designed for operation with voltages of from 200 to 6600. Detailed views are given of the component parts of this motor and the descriptive matter relates to the method of construction. No. 2443 is devoted to the subject of motors for crane and hoist service and curves showing the temperature rise, horsepower, torque and efficiency of both the direct-current series wound and alternating-current wound rotor motors are reproduced. The text explains the curves and their applications and it also gives specifications for motors of this character.

**Mechanical Rubber Goods.**—Peerless Rubber Mfg. Company, 16 Warren street, New York City. Catalogue No. 100. Size, 3¼ x 8¼ in.; pages, 196. Covers an extensive line of mechanical rubber goods, which includes sheet, piston, valve rod and pump packings; gaskets, rubber and canvas belting and steam, air brake, pneumatic tool, mill and underwriters' fire hose. Pump valves, diaphragms, fire pails and buckets and various styles of rubber matting are also shown. All of the different specialties are illustrated and briefly described with price lists. The various types of belting are shown in service and considerable useful information is given on the use of this type of belt, how to splice it and the amount of horsepower it will transmit. A complete telegraphic code is also included.

**Taps and Dies.**—J. M. Carpenter Tap & Die Company, Pawtucket, R. I. Catalogue No. 19. This catalogue supersedes all previous editions and lists a line of tools for cutting screw threads. Among these are taps of all kinds, including machinists' hand taps, nut taps, pulley taps, machine screw taps and taper taps. Square and round bolt and pipe dies are shown together with a patent tap and reamer wrench and set of round dies in cases. All of these are regularly made with the United States standard thread and in some cases the A. L. A. M. and the A. S. M. E. threads are also furnished. Whitworth and V threads can also be furnished but their use especially that of the latter is not recommended. A number of tables of useful information complete the catalogue.

**Bearing Metal.**—Palmetto Metal Company, Chicago, Ill. Booklet. Lists the various kinds of bearing metals made by this company, and briefly points out their special advantages. These metals include ones for gas engine, crank and cross-head bearings, rolling mill service, heavy high-speed machinery, electric railway motors, locomotive and car bearings, cement machinery and similar service. In addition to these metals special ones can be made to order.

**Molding Machines.**—E. Killing's Molding Machine Works, Davenport, Iowa. Loose-leaf catalogue No. 10. Size, 6¼ x 10¼ in. This catalogue is indexed for each type of molding machine manufactured which includes stripper plate machines, rollout rollover automatic squeezers, jarring rockover machines and a multiple-cylinder jarring machine to which particular attention is called. The line of accessories manufactured by this company including taper steel flasks, match plates, vibrators, etc., is also presented.

**Metal Stampings.**—Globe Machine & Stamping Company, Cleveland, Ohio. Pamphlet. Shows some of the special stampings turned out by this company as well as the tumbling barrels and tool and battery boxes which are regularly carried in stock. In making up the pamphlet, a brief description of the stamping is given on the left hand page with halftone engravings on the facing one. Among the stampings illustrated are brake drums, gear cases, wrenches, storage tanks for gasoline and water, a metal shop stool and numerous hub caps and flanges.

**Circuit Breakers.**—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Folder No. 4049. Cover the type F carbon circuit breaker which is intended for the protection of small direct-current motor installations and lighting circuits. The device is light and compact and combines the functions of a fuse and a switch in one piece of apparatus.

## The Machine Tool Builders' Convention

The semi-annual convention of the National Machine Tool Builders' Association will be held at the Chalfonte, Atlantic City, Thursday and Friday, May 16 and 17. The programme includes papers by Fred Rogers, New York, on "How the Mechanical Journals Can Be Made of Most Value to Their Patrons"; Charles E. Carpenter, Philadelphia, on "The Value of the House Organ as an Advertising Medium"; James H. Herron, Cleveland, permanent secretary of the association, on "What the Association Can Do for Its Members"; and Charles E. Hildreth, Worcester, Mass., on "What the Future Has in Store for Us." Fred A. Geier, Cincinnati, will make a report on the tariff problem.

The Muirkirk Furnace at Muirkirk, Md., is now operated by Ellery F. Coffin as an individual, and not by E. F. Coffin & Co., as erroneously stated in *The Iron Age* of April 11. Mr. Coffin has been manager of the furnace for 20 years. The product is charcoal pig iron made from roasted carbonate and hematite ores, and shown by certified tests to run from 40,000 to 50,000 lb. tensile strength. Rogers, Brown & Co. are exclusive sales agents.

The sheet mills of the Alan Wood Iron & Steel Company and the J. Wood & Brothers Company, at Conshohocken, Pa., were idle last week pending a wage adjustment with their employees. Operations were resumed April 29, an agreement having been reached to advance wages approximately 10 per cent.

## Western New York Industries

The bulletin of the Census Bureau covering the thirteenth United States census, taken in 1910, shows large industrial growth in the western New York cities of Niagara Falls, North Tonawanda, Jamestown, Olean, Batavia and Dunkirk. This bulletin does not include Buffalo, for which a separate bulletin was previously issued. Niagara Falls has the most horsepower in manufacturing plants, having more power than all the other cities in western New York outside of Buffalo.

The following table shows the important industrial facts covered by the census report for the cities in which notable industrial growth occurred from 1905 to 1910, the figures given representing the totals at 1910:

| City                 | Population | No. of industries | Horsepower used | Employees | Wages and salaries | Capital invested | Cost of raw material | Value of products |
|----------------------|------------|-------------------|-----------------|-----------|--------------------|------------------|----------------------|-------------------|
| Niagara Falls.....   | 30,440     | 156               | 95,792          | 7,214     | \$5,029,000        | \$37,239,000     | \$14,271,000         | \$28,652,000      |
| North Tonawanda..... | 11,955     | 81                | 15,888          | 3,146     | 1,882,000          | 8,274,000        | 6,389,000            | 9,600,000         |
| Jamestown.....       | 32,608     | 156               | 11,679          | 7,753     | 4,300,000          | 16,075,000       | 7,384,000            | 14,720,000        |
| Dunkirk.....         | 17,723     | 57                | 5,194           | 3,301     | 1,963,000          | 7,079,000        | 3,208,000            | 6,576,000         |
| Olean.....           | 15,155     | 54                | 5,202           | 2,671     | 1,679,000          | 8,952,000        | 7,728,000            | 10,005,000        |
| Batavia.....         | 11,959     | 59                | 3,204           | 2,346     | 1,309,000          | 5,637,000        | 1,781,000            | 2,620,000         |

# The Machinery Markets

Activity in the machinery trade is generally greater in the East than elsewhere, although a favorable indication in the Middle West is quiet buying by the railroads. The New York market has been more active in the last week and was helped out greatly by some unexpected sales of good size. In New England the undercurrent of business continues strong and a good average has been maintained. Some fair sales have been made in Philadelphia where there also has been inquiry of miscellaneous kinds, although a falling off has been noted in the demand for heavy tools. Baltimore sales in April will exceed those of March, and in that city there is good inquiry for wood working machinery. The Cleveland market has not been as active in the last few days and the call has been mostly for single tools. In Cincinnati, railroads have done some quiet buying, while another good symptom is the activity of jobbing foundries, which are working full time. Sales in Detroit amounted to a good figure when summed up, though they were small individually. In Chicago several railroads have inquiries out for one or two tools each, while the Wabash has placed substantial orders against its large list of recent date. Good sales of second-hand tools have been a feature in St. Louis; the South generally is quiet, although in Texas business is reported fair, and unusually good cotton crop prospects are stimulating the demand for cotton machinery. Labor troubles have retarded trade on the Pacific coast, where the demand most notable is that for water-power equipment. A number of large electric installations are projected or under construction in the Pacific coast States.

## New York

NEW YORK, May 1, 1912.

Greater activity prevailed in the New York machinery market in the last week, not only because of continued improvement in small lot sales but because of the placing of business which ran into good figures. Practically all dealers admit that their sales for April will make a good showing. Various causes, including the threatened strike of the coal miners and the locomotive engineers, have delayed the complete closing of the Delaware & Hudson list for the new Watervliet shop. While the trade is satisfied as to how some of the business will go orders have been held in abeyance and many bidders are still waiting. The closing of a part of the business which developed within the week came unexpectedly. Especially pleasing was the purchase by the McEwen Company of Wellsville, N. Y., of machine tools and equipment for shipment to Tulsa, Okla., where the firm is to manufacture oil well machinery. The list, which represented an expenditure of about \$40,000, included a 24-in. Gisholt turret lathe, Cleveland punch and shear, Ryerson saw, riveter, Cincinnati miller, Cincinnati Bickford radial drill, Cincinnati Bickford vertical drill, 72-in. Colburn vertical boring mill, a large New Haven lathe, a Cincinnati cutter and reamer grinder, also foundry and other equipment. The Norfolk and Western Railway whose requirements of shop equipment were last referred to March 6 in *The Iron Age*, has begun to place orders.

The Kerr Turbine Company, Wellsville, N. Y., is in the market for a horizontal boring, drilling and milling machine of the floor type, of about 4-in. spindle, 30-in. travel and of capacity to bore to the center of 50 to 60 in.

The Roanoke Iron Works, Inc., Roanoke, Va., is in the market for a quantity of pressed steel hangers of various sizes. The company wishes to get the exclusive agency for such hangers in its territory, and is asking for general information on the subject.

The National Carbon Company, Cleveland, Ohio, manufacturer of dry batteries, has purchased the entire block bounded by Grove, Henderson, Thirteenth and Fourteenth streets, Jersey City, N. J. A large building will be erected there, plans for which have not as yet been prepared, and upon completion will abandon its present plant at West Side avenue. It is not expected that the erection of a plant will be started before next spring.

The factory of the Weber-Knapp Company, Jamestown, N. Y., manufacturer of hardware specialties, was badly damaged by fire April 24.

The name of the Huntington-Barger Machine Company, Jamestown, N. Y., has been changed to the Chautauqua Lake Engine Company.

The basket factory and woodworking plant of Eugene C. Cobb, Sherman, N. Y., was destroyed by fire April 25, with a loss of \$15,000 on building and machinery.

The Sterling Furniture Company, Salamanca, N. Y., has let contracts for the construction of a factory addition, 50 x 114 ft., four stories and basement.

The H. H. Franklin Automobile Company, Syracuse, N. Y., has let contracts for an addition, 150 x 200 ft., four stories and basement, to be erected on Gifford street. It is also having plans prepared for an addi-

tional factory building, 200 x 200 ft. six stories and basement to be erected later on Geddes street.

Deere & Co., who recently purchased the plant of the Syracuse Chilled Plow Company, Syracuse, N. Y., have completed plans for a considerable enlargement of the newly acquired plant.

The Mercedes Motor Car Company, Berlin, Germany, has completed negotiations for taking over the factory of the Kelly-MacBean Company on Main street, Niagara Falls, N. Y., where it will establish a branch plant for the manufacture of automobiles.

The American Glove Company, Dunkirk, N. Y., has completed plans for building an additional story on its present factory.

The plant of the Howard A. Pierce Electric Light Company, Hamburg, N. Y., has been purchased by Albert Dodge of that place, who will erect an additional power house on Prospect avenue and equip it for a new system of street lighting.

The Board of Water Commissioners, Binghamton, N. Y., has voted to construct an addition to the city's filtration plant at a cost of about \$75,000.

Charles H. Kavanaugh, Waterford, N. Y., has completed plans for the erection of a bleachery at that place on a site recently purchased.

The Thatcher Mfg. Company, Elmira, N. Y., will erect a one-story factory with 56,000 sq. ft. of floor space for the manufacture of milk bottles and caps, plans for which have been completed. The contract has been given to the H. L. Dixon Mfg. Company, Pittsburg, for two fire clay furnaces of 26 tons capacity each, with gas producers capable of generating 2600 deg. F.

Beal's Patent, Inc., Scarsdale, N. Y., is the name of a company incorporated with a capital stock of \$50,000, which will equip a plant to manufacture caps, stoppers and closures for containers, etc. W. W. Beals and A. T. Cole, Scarsdale, are among the incorporators.

Governor Dix of the State of New York has signed the bill authorizing the Board of Water Commissioners of Waterford, N. Y., to establish a water works system at a cost not to exceed \$200,000, either by acquiring and improving the present system or by construction of a new system.

The Clark Paper & Mfg. Company, 82 Mill street, Rochester, N. Y., has completed plans and is receiving bids for a brick factory and warehouse, 64 x 170 ft., four stories and basement, which it will erect at Greece, N. Y.

The Russ & Krekel Company has been incorporated at White Plains, N. Y., to manufacture and install steam power heating and ventilating apparatus. E. T. Child, G. M. Scott and J. E. Jeffery, New York City, are the incorporators. The company has a capital stock of \$40,000.

The King Fire Signal Company, Millbrook, N. Y., has been incorporated with a capital stock of \$500,000 and will establish a plant for the manufacture of fire alarm devices, etc. W. J. Hildebrandt, Brooklyn, and J. R. Aldrich and G. F. Johnson, New York City, are the directors.

The Morrow Mfg. Company, Elmira, N. Y., will build a one-story addition to its factory at South Main and Scott streets, for the manufacture of coaster brakes. The estimated cost of the addition and equipment is \$100,000.

The Motor Mail Transportation Company, Rye, N.



Y., has been incorporated with a capital stock of \$60,000 to manufacture vehicles for the transportation of mails, etc., and will arrange for a plant. The incorporators are J. J. Cassidy, H. G. Warnock and W. C. Prime.

The Case Bros. Cutlery Company, Springville, N. Y., has completed plans for a new manufacturing plant and construction will be commenced at once. Power will be furnished by the village.

The Whyland-Nelson Motor Car Company, Buffalo, N. Y., is arranging for the removal of its manufacturing plant to Batavia. Frank V. Whyland, 91 Claremont avenue, Buffalo, is president. The company manufactures a convertible business and pleasure automobile.

Architects Esenwein & Johnson, 781 Ellicott Square Building, Buffalo, have been retained to supervise the reconstruction of the waterworks pumping station at the foot of Porter avenue for the city of Buffalo, to replace the structure which collapsed last summer when nearing completion. The building will be of structural steel, stone, brick and concrete and is estimated to cost \$350,000.

The Buffalo Electric Vehicle Company, Buffalo, recently incorporated with a capital stock of \$1,000,000, has elected its officers as follows: Samuel J. Dark, president; A. A. Landon, vice-president, in charge of manufacturing; William A. Morgan, vice-president, in charge of sales; Harry Yates, treasurer, and Alfred W. Thorn, secretary. The new company is a merger of the Babcock Electric Carriage Company, Buffalo, the Clark Motor Company, the Buffalo Electric Carriage Company and the Buffalo Automobile Station Company. The three existing manufacturing plants of the consolidated company will be operated as heretofore for the present; but material enlargement of manufacturing facilities is contemplated for the near future. The main plant of the company is at West Utica street and Elmwood avenue, formerly the factory of the Babcock Electric Carriage Company.

## New England

BOSTON, MASS., April 30, 1912.

The undercurrent of business continues strong, according to what appears to be the consensus of opinion, in which there are a few exceptions. Builders of heavy machine tools report increasing inquiries and also increasing orders. The percentage of production to capacity varies as between the works of the machine tool builders; some are very busy, others only moderately so. But no doubt exists that the average is higher. Builders of equipment for steel and wire mills report more numerous inquiries and orders in proportion. General business, within and outside of the metal trades, is better. The textile machinery people find a gradually growing demand, though their business is not normal, owing to the prolonged depression in the trade which they serve. The wire mills are active and so are the manufacturers of wire goods.

The Standard Plunger Elevator Company has moved a part of its executive department from the offices at 115 Broadway, New York, to Worcester, Mass., where the shops are located. However the offices of the treasurer, auditor and sales department will remain at 115 Broadway. More of the bookkeeping will be done at Worcester, which will also be the home of the estimate and engineering departments.

The contract has been awarded for a new machine shop to be built by the General Electric Company at its plant at Pittsfield, Mass. The building will be 150 x 375 ft. The steel work is already erected.

The Springfield Street Railway Company, Springfield, Mass., one of the New York, New Haven & Hartford's holdings, has bought a large tract of land at West Springfield, and it is believed a larger repair shop will be erected on the premises, though no announcement to that effect has been made.

Plans are under way for the reorganization of the Rhode Island Coal Company, which has been operating a mine at Portsmouth, R. I., and which is now in the hands of a receiver. Henry M. Whitney, Boston, is at the head of the project, which includes the formation of a new corporation and the increase in the capacity of the mine equipment to 600 tons daily.

The C. G. Armstrong Mfg. Company, Meriden, Conn., has incorporated under Connecticut laws to manufacture jewelry with factory at Meriden. C. G. Armstrong is the president and treasurer.

The Hendee Mfg. Company, Springfield, Mass., manufacturer of motor cycles and motors, will erect an addition to its works consisting of two stories on top of a three-story building 40 x 88 ft. A boiler house and storehouse will be built later.

Additions to manufacturing plants of New England

just announced include the following: McElwain Company, Manchester, Conn., shoes, factory building, 44 x 594 ft., six stories; Appleton Company, Lowell, Mass., textiles, mill building, 96 x 210 ft., five stories and basement, of brick and steel, fireproof construction, the first floor to be occupied as a machine shop and carpenter shop; F. J. Braithling, Bridgeport, Conn., factory building, 56 x 100 ft., two stories; J. S. Mason, Westboro, Mass., textiles, mill to accommodate 100 looms.

The Charles Niedner's Sons Company, Malden, Mass., manufacturer of linen and fire hose, is to establish a Canadian mill in the suburbs of Quebec.

The Blakeslee Forging Company, Plantsville, Conn., proposes to build a large addition to its plant.

The new Industrial Development company of the Boston Chamber of Commerce has already demonstrated the value of its existence in the fact that 11 of the city's industries, most of them new, have been assisted by loans aggregating \$49,000, ranging in size from \$1,000 to \$15,000. These concerns are mostly small and not developed to the point of obtaining credits from the banks to the extent required in their growth at this time.

## Philadelphia

PHILADELPHIA, PA., April 30, 1912.

Several fair sales of machine tools to users of metal working machinery in this district have been reported, one involving the sale of a large number of grinding machines being the most important. Several small groups of tools have also been disposed of, although the bulk of the business is still confined to single tool propositions. Orders have, with one or two exceptions, been pretty well distributed, so that the total purchases have not shown any individual betterment in conditions, and general reports from both merchants and manufacturers indicate but little change in the situation. In fact some builders of the heavier types of machine tools note a slight decline in the aggregate volume of business recently closed. The opinions expressed as to future conditions border on the optimistic. Encouragement is taken in the adjustment of the differences between the coal miners and operators. The impending difficulty between locomotive engineers and the railroads appears to have been averted, and the most encouraging factor is the continued activity of the iron and steel mills, which have, after a long period of depression, reached a point where advances in prices of finished products could in many cases be made and maintained. The machine tool trade does not usually feel the benefits of improved conditions in the industrial field until they are in full swing, and it begins to look as if that time was near at hand.

A very fair volume of miscellaneous inquiry for machine tools is noted, but buyers, knowing that quick deliveries are available in nearly all lines, are not hastening to place their orders. The railroads are still a negligible factor in the machine tool trade.

The demand for boilers and engines, both new and second hand, continues fair. A moderate movement in second hand machine tools and general machinery is also reported.

The machine shop of the Allentown Rolling Mills, Allentown, Pa., was completely destroyed by fire April 23. The foundry and pattern shop were saved, and we are advised that while the concern will be considerably inconvenienced and delayed in making deliveries it will proceed as rapidly as possible to rebuild the shop and expects to get in partial operation in the very near future.

The American Railway Company, Witherspoon Building, controlling the Bridgeton Electric Company, Bridgeton, N. J., is taking bids for a brick and concrete power house, 34 x 92 ft., one story, from private plans.

Wm. Sellers & Co., Inc., have purchased a tract of 46 acres of land at Folsom Station, on the Baltimore & Ohio Railroad, as a site for possible plant extensions. The property is located 10 miles from Philadelphia. It will also have a connection with the Philadelphia, Baltimore & Washington Division of the Pennsylvania Railroad. It is not the intention to erect a plant at this time, the purchase being made with a view of protection for future enlargements.

The Midvale Steel Company has had plans prepared for a brick and steel building, 46 x 100 ft., one story, with a wing 100 x 20 x 109 ft., to be erected at its Nicetown plant. The use of the building is not stated.

Plans are in progress, it is stated, by Evans, Warner & Bigger, architects, Witherspoon Building, for a garage, laundry and power house to be erected at Paoli, Pa., for S. B. Davis. The power plant will include electric lighting and steam heating.

The Lafayette Motor Car Company, Easton, Pa., recently incorporated, has a building 100 x 125 ft. in course of erection, which will be used for the manufacture of automobile trucks. Information regarding the equipment of this plant has not been available.

The Atlantic Radiator Company, of this city, is making extensive improvements to its plant at Huntingdon, Pa., including enlargements of some of its buildings and the installation of additional equipment. A new core room, 60 x 80 ft., with the necessary equipment, is being added, an electric elevator for serving its cupola has been installed, and a new radiator testing plant will also be added.

The buildings and equipment of the Chester Engineering & Machine Company, bankrupt, Chester, Pa., will be sold by the trustee May 7. A large quantity of metal working machine tools, special machinery for gasoline motor manufacture, and machinery, jigs, etc., for the manufacture of pipe bending machines, together with patterns, machine shop and storage buildings, will be disposed of. Norris D. Powell is receiver. Catalogues giving full details may be obtained from James A. Freeman's Sons, auctioneers, Philadelphia.

The Haines, Jones & Cadbury Company is building a two- and three-story addition to its factory, 60 x 108 ft., which will be used for warehouse and manufacturing purposes. The basement and first floor will be used for the storage of pipe and metals, while the second and third floors will be devoted to extensions of its pattern shop and brass foundry department.

The Barber Motor Car Company, York, Pa., has increased its capital stock from \$10,000 to \$30,000, and states that it will in all probability materially increase its plant, but up to the present time no definite arrangements have been made as to the character of any extensions.

The Reading-Bayonne Steel Castings Company, which is reported to be planning extensive improvements to its Reading plant, advises that the addition referred to consists of an up-to-date office building.

The Germantown Tool Works, whose plant was partially destroyed by fire several months ago, has purchased about three acres near Second street and Duncannon avenue, on which it will erect a new plant. Plans are being prepared by John G. Brown and will include seven separate one-story buildings, ranging in size from 30 x 100 x 40 x 100 ft.

The South Allentown Bridge Company, Allentown, Pa., has been granted permission to increase its debt and capital stock to \$225,000. This company will erect the large bridge over the ravine at Eighth street, Allentown, Pa.

A new bridge is to be erected over the body of water at Catasauqua, at Race street. Details can be secured from Judge Frank M. Trexler, Allentown, Pa.

The A. P. Witteman Company has practically completed the erection of an addition 90 x 130 ft. to the machine shop at its Chester, Pa., plant, and will soon begin the installation of machinery, which will include a 1600-ton forging press. Several double regenerative oil fuel heating furnaces and two annealing furnaces, one 10 and the other 30 ft. long, will also be built for the scientific heat treatment of steel forgings.

The Tygert Allen plant of the American Agricultural Chemical Company, Weccacoe street and the Delaware River, had one of its raw material warehouses destroyed by fire on April 24. The loss is estimated at \$10,000, but will in no way interfere with manufacturing operations. A new and larger warehouse will be built to replace the one burned.

## Baltimore

BALTIMORE, Md., April 30, 1912.

While there is still a tendency toward irregularity in general business, April in a number of instances showed a material improvement over March in the volume of business closed, particularly during the latter half of the month. In certain lines, such as heavy machine tools, the demand still drags, but there has been a better volume of medium and small tool sales, both in the way of single tools and small groups, involving both metal and wood working equipment. Inquiry for the latter class of equipment also shows some little betterment. Special machinery builders generally continue quite busy, although makers of the heavier class of tools are still rather inactive.

Fabricators of structural material have been somewhat better engaged, but the work taken has been almost entirely in small contracts, for which there is still a good demand. Large propositions involving any considerable quantity are scarce in this vicinity and do

not appear as plentiful in the South as was the case some months ago. Structural work in connection with apartment house building shows some increase.

While there has been a fair volume of business moving in steam boilers, the demand for engines has decreased. Considerable power equipment business is under negotiation but develops very slowly. A very fair seasonable demand for contractors' equipment is reported, while that for machine shop and general mill supplies has been somewhat broader. Railway buying of machine tool equipment has been practically at a standstill, although some moderate business is developing in the South. Railroads are more aggressive buyers of rolling stock. Numerous additions to manufacturing plants are reported. In many cases these involve little further purchases of equipment, although elevators and heating systems are usually planned for. The general tone of business is somewhat more favorable. While but few in the iron, steel and machinery trade are decidedly optimistic, the belief that the present movement will continue to grow is general and a further betterment in business conditions in May is being looked forward to.

Moses Solmson proposes to erect a one-story brick and stone garage 38 x 105 ft. on Whitelock street near Callow avenue from plans by Henry J. Tinley, architect. The foundation and floors are to be of concrete and accommodations will be provided for 16 automobiles.

The report that the Bagby Furniture Company would build a four-story concrete addition to its plant at Canton avenue and Exeter street and would install considerable additional machinery is denied. The company is making only minor alterations to its present plant.

The Sawyer Smith Company has been organized with a capital stock of \$50,000 and proposes to erect a wood working plant as soon as a site can be determined upon. One of the company's specialties will, it is said, be the manufacture of bowling alley equipment. Edward H. Sawyer, Jr., is president and Louis E. Smith secretary of the new company.

George R. Morris, architect and engineer, is taking sub bids for the construction of a five-story warehouse and storage building to be erected at 1404-1406 Division street for Charles H. Kaufman. The building is to be of brick and concrete, electric light and steam heat will be installed and at a later date proposals for power and elevator equipment will be asked.

Contracts have been awarded for a large packing plant and storage building to be erected for the John Boyle Company at Wolfe and Thames streets, East Baltimore. The building is to be 155 x 240 ft., two stories, of brick and stone. Electric light, steam heat and the necessary packing machinery are to be installed.

Plans are being prepared, it is stated, by O. G. Simonson for a six-story brick and concrete fireproof factory building at Exchange place and Commerce street for McCawley & Co., to be used as a factory for manufacturing wearing apparel. It is proposed to heat the building by steam; elevators will also be installed.

George Spindler, furniture manufacturer, will build a four-story brick addition to his plant at 608 West Pratt street. On completion machinery now in use will be moved to the new building and possibly some additional electrically driven wood working machinery, such as moulding machines, etc., installed. The present power equipment will serve the new building.

Plans have been completed by S. Russell, architect, for a large apartment house to be built on Mount Royal avenue, near Druid Lake, to be known as Phoenix Court. The building is to be four stories, and will cost approximately \$125,000. It is to be equipped with a high speed elevator, lighted by electricity and probably heated with hot air.

The Aumen Machinery Company has taken the agency in the Baltimore district for the line of pumps manufactured by the Pulsometer Steam Pump Company, New York. The demand for machinery and tools is reported by this concern to have shown a material improvement in April. A very fair volume in single tools, as well as small groups, has been sold, including metal and wood working tools, and also in pumps. Small tools and supplies have also been active. Inquiry continues good and the outlook for future business is more encouraging.

Hiram Winternitz has acquired a new site at Front and Lombard streets and Jones Falls, having an area of about 150 x 150 ft. In addition to using this as a scrap yard, the plant will be equipped with machinery and facilities for the conduct of a fabricating plant in structural steel and ornamental iron work.



## Cleveland

CLEVELAND, OHIO, April 30, 1912.

Business with the local machine tool houses is not active. The volume of orders in the past week shows practically no change as compared with the previous two or three weeks. Some dealers, however, report a slightly better volume of inquiry. The aggregate volume of orders in April will scarcely equal that of March, as there was quite a spurt of buying in the previous month. New business is almost entirely in scattered orders for single tools. The largest order reported placed with a dealer in the week was for five machines aggregating about \$5,000. A considerable portion of the new business is coming from manufacturers associated with the automobile industry, although the automobile makers themselves are doing very little buying, orders from this source being almost entirely for single tools.

Generally the manufacturing situation in metal working lines in this territory has improved. However, while most plants are fairly busy they are well supplied with machinery equipment and orders for machinery are usually for replacements rather than to add to present capacities.

The Cleveland Foundry Company, Cleveland, Ohio, maker of oil stoves, will shortly begin the erection of a large six-story brick and steel addition to its plant. This building will be used for manufacturing and storage purposes and in it a power plant will also be installed.

The Park Drop Forge Company, Cleveland, Ohio, has had plans prepared for a new machine shop and office building. This building, the construction of which will be started early in the summer, will be 65 x 120 ft. with open bay in center and second floor balcony around the outside. It will also have a basement.

The North Electric Company, Cleveland, Ohio, has practically completed negotiations for the removal of its plant to Galion, Ohio. According to the terms of the agreement with a committee of Galion citizens that city is to raise \$100,000. Several other cities have been striving to secure this plant. The company will erect a large new plant for the manufacture of telephone apparatus.

The Columbia Metal Stamping Company, Cleveland, Ohio, which recently built a new plant at 1538 East Forty-ninth street, has been incorporated with a capital stock of \$25,000. The business was formerly conducted as a partnership. Because of poor health Jacob Lewin, formerly a partner with Fred C. Koch in the business, has sold out his interest to James C. Ertel. The new officers are Fred C. Koch, president and general manager, and James C. Ertel, secretary and treasurer. The company's new plant is 48 x 106 ft. and three stories. It does a jobbing work in metal stamping, and also makes tools, dies and special machinery.

The Wise Furnace Company, Akron, Ohio, will shortly begin the erection of a new foundry at its present site on Lincoln and Forge streets, Akron. The building will be 150 x 200 ft., of steel and reinforced concrete construction. The building of a foundry will be followed by the erection of other buildings that will make an entirely new plant for the Wise Company. These will include a machine shop, warerooms, shipping rooms, etc.

A new plant will be established in Ashtabula, Ohio, by the National Corrugated Box Company, which has purchased the plant of the Ashtabula Machine Company. The plant is now being remodeled. The company will manufacture metal boxes for various purposes. The officers of the company are: L. L. Harr, New York, president; Fred W. Coon, New York, vice-president; T. E. Hayes, Middletown, N. Y., treasurer, and S. F. MacDonald, Ashtabula, secretary.

Machinery is being placed in the plant of the Warren Forge & Tool Company, Warren, Ohio, which will shortly be ready for operation.

The Cleveland Bronze & Brass Company, Cleveland, Ohio, will erect a new factory building on Hamilton avenue. It will be a four-story structure of brick, steel and reinforced concrete construction.

The Sanitary Tool Specialty Company, Cleveland, Ohio, has been incorporated with a capital stock of \$100,000 to manufacture butchers' supplies. Harry L. Wibble, Robert G. Irwin and others are incorporators.

The Steel Post Company, Kent, Ohio, has been incorporated with a capital stock of \$100,000 by James A. Raub, R. R. Spoor, Clyde C. Smith and others.

The City Council of Salem, Ohio, has decided to advertise for bids for an air compressor for the municipal waterworks plant.

The Standard Mfg. Company, Cleveland, Ohio, the Cleveland selling organization of the Standard Sanitary Mfg. Company, Pittsburgh, maker of plumbers' supplies, will build a five-story store and warehouse on Euclid avenue, near East Forty-sixth street. The only machinery to be installed will be pipe threading machinery.

The Berger Mfg. Company, Canton, Ohio, will increase its output of metal furniture. A large four-story plant which the company is about to erect will be used for its metal furniture department.

The Columbia Chemical Company, Barberton, Ohio, will build some additions to its plant.

The Superior Iron & Mfg. Company, Wausen, Ohio, will enlarge its plant. It has secured an adjoining building which will be occupied for foundry purposes.

South Bend, Ind., will receive bids May 9 for power equipment for its waterworks pumping station, which will include two 5,000,000 gal. high pressure pumps and two 6,000,000 gal. low pressure pumps.

The Galion Metalic Vault Company, Galion, Ohio, will enlarge its plant by the erection of a brick building 50 x 80 ft., three stories.

The Toledo Machine & Tool Company, Toledo, Ohio, has awarded a contract for a building, 90 x 115 ft. and three stories, of brick and iron construction, which will be used in connection with its present business.

## Chicago

CHICAGO, ILL., April 30, 1912.

Although inquiry for machine tools is somewhat lighter than in the past fortnight, a decidedly promising outlook for business from automobile and agricultural implement interests is held out. In preparation for the manufacture of the next year's models, automobile manufacturers will be under necessity of installing many new machines and in addition a number of instances of increased capacity are expected to result in a large aggregate of business. Orders the past week have been of a scattering nature but with a fairly good aggregate value. Several of the local railroads are inquiring for one or two machines, the largest inquiry being that of the Santa Fé for machines aggregating in value between \$3,000 and \$4,000. The Wabash Railroad placed orders on its recent list to the amount of about \$100,000, of which approximately half were taken by a leading manufacturer of railroad tools; the remainder was distributed.

The Smith Rivet Company has been incorporated with a capital stock of \$2,500 to engage in a machinery and manufacturing business, the incorporators being P. Rosenberg, H. Hennessy and William B. Ward.

The Power Saving Company has been organized for the handling of machinery and mechanical devices by L. H. Dahl, Preston W. Barclay and Albert J. Geis.

The Firestone Steel Foundry, Inc., has been organized with a capital stock of \$10,000 by Roger L. Foote, A. A. Firestone and M. M. Choate.

The Continental Brick Company, Aledo, Ill., has been incorporated with a capital stock of \$100,000 to manufacture brick and tile. The incorporators are: Lamont Cowles, Peter Magel, J. L. Buckley.

The Levitt Mfg. Company, Urbana, Ill., is replacing its burned plant with a \$5,000 addition, which it expects to have completed shortly.

The Havana Metal Wheel Company, Havana, Ill., is about to begin construction work on a new plant to replace the one recently burned.

The Cereal Food Company, Peoria, Ill., will build a new factory to cost \$50,000.

The Des Moines Structural Steel Works, Des Moines, Iowa, has filed articles of incorporation with a capital stock of \$25,000 for the purpose of engaging in the fabrication of structural steel. George W. Newell is president; L. H. Hixson, vice-president; R. C. Powell, secretary and treasurer.

The Des Moines Silo & Mfg. Company, Des Moines, Iowa, is about to begin the erection of a new plant consisting of foundry, machine shop and warehouse.

F. B. De Witt, city clerk, Griswold, Iowa, will receive proposals until May 6 for water works extension for that city.

The Stephens Stand-up Scrubber Company has arranged to build a new factory at Aurora, Ill., construction work to begin as soon as possible.

The Warner Instrument Company, Beloit, Wis., has let the contract for an addition to its plant 96 x 120 ft., which will increase its present manufacturing capacity over 50 per cent. Construction work will commence at once.

The Fond du Lac Church Furniture Company, Fond du Lac, Wis., is preparing plans providing for the erection of a large addition to its plant.

The Globe Iron Works, Duluth, Minn., is moving to a new shop on Lake avenue in that city, where facilities will be materially increased.

The Minneapolis Artificial Ice Company, Minneapolis, Minn., has begun work on the erection of an ice plant that will have a capacity of 100 tons daily. The plant will be installed in two units of 50 tons each, operated with motor power and producer gas engine respectively.

## Cincinnati

CINCINNATI, OHIO, April 30, 1912.

Although the railroads have been trying to keep under cover all orders placed lately for machine tools, it has leaked out that considerable business has been booked from this source recently. These railroad orders mainly call for a small number of tools and they have been scattered around among several different tool builders. The domestic business is also showing up better, but there is no change in the export trade as reported last week.

The jobbing foundries have nearly all found it necessary to increase their melt and quite a number are operating on full time.

Second-hand machinery is in fair demand, and it is reported that Southern sawmill operators have been good customers in the past two weeks.

The Modern Foundry Company, Oakley-Cincinnati, Ohio, will soon let contract for an addition to its plant that will be 36 x 190 ft., one story and of brick and steel construction, with sawtooth roof. Considerable equipment will be required for the new addition. Rapp, Zettel & Rapp, Johnston Building, Cincinnati, drew up the plans for the proposed structure.

The Cincinnati Gear Company, now at Ninth street and Broadway, has acquired a site on Reading road, near Florence avenue, on which it intends to erect a factory building large enough to take care of its rapidly increasing business. Architect G. W. Drach, Cincinnati, is drawing up the plans for the new structure.

The Reliance Coal & Coke Company, Cincinnati, recently mentioned as succeeding the Cincinnati Gas, Coke & Coal Mining Company, will soon commence work on an additional coal elevator.

The Nimmo Fence & Wire Works Company, whose main office is at 305 East Fourth street, Cincinnati, has acquired a site at Oakley on which it intends erecting a factory building 90 x 140 ft., two stories and of brick and steel construction. The company's present plant is in Linwood suburb. Considerable additional machinery equipment will be required.

The Mooney Belting Company, Cincinnati, recently mentioned as being incorporated, has nearly completed the installation of equipment in its three-story plant at Sixth and Baymiller streets, and expects to be in operation within the next few days.

William Barker & Co., Cincinnati, machine tool builders, whose plant was recently badly damaged by fire, have definitely decided not to move from the old location at Culvert and Pioneer streets, as was recently reported. Repairs on the company's plant are under way and it will be in full operation within a few days.

The Holden Paper Box Company, Cincinnati, has been incorporated with \$10,000 capital stock. It has leased a building at 108-110 West Third street that will be fitted up for the manufacture of paper boxes, cartons, etc. R. A. Holden, Jr., is president and treasurer and E. A. Branditz, secretary. Considerable special machinery will be required to fit up the new plant.

There is a current report that the old Licking Rolling Mill in Newport, Ky., recently purchased by Hilb & Bauer, Cincinnati scrap iron merchants, will be moved across the river to a site with railroad connections and put in operation at an early date.

Nothing definite is known of the manufacturing plans of the Ohio Portable Coupler Company, recently incorporated at Columbus, Ohio, with \$25,000 capital stock, to make a malleable iron car coupler. D. E. Reagan and A. L. Thurman are among the incorporators.

It is rumored that the Muncie Gear Company, Muncie, Ind., contemplates moving its plant to one of Cincinnati's manufacturing suburbs.

Architect G. W. Drach, Cincinnati, has completed plans for the 14-story steel hotel building to be erected for the Gibson House Company. Contractors' bids will be received until May 20.

## Detroit

DETROIT, MICH., April 30, 1912.

Machinery merchants in Detroit have done fairly well the past week and trade seems to be on a more even basis. Orders have for the most part been small individually, but represent a good aggregate and are from a more widely diversified trade than has been noted for some time. The business for the month, while quite satisfactory, has not shown a marked increase in total sales over that of March. The automobile industry has apparently about completed its season's purchases, except in some scattered instances, causing a contraction in standard metal working tool demands. The market for second hand machinery is moderately active, the demand not being confined to any particular class of equipment. Building conditions continue to show an improvement, with a large amount of construction under way.

The Maxeff Electric Horn Company, Detroit, has been incorporated with \$15,000 capital stock to manufacture a line of patented automobile and motor boat horns. The principal stockholders are A. E. Richardson, B. F. Weadock and Arthur Webster.

The Republic Motors Company of Michigan has been incorporated with \$20,000 capital stock for the stated purpose of engaging in the manufacture and sale of automobiles and auto parts. W. C. Durant is the principal stockholder.

The Gemmer Mfg. Company, Detroit, manufacturer of automobile gears, will enlarge its plant on Stanton avenue, by the erection of a new building to be used as a forge shop. Contract for the structure has been let.

The Albert F. Pudrith Company, Detroit, manufacturer of metal and composition roofing, has completed plans for a new factory to be located on East Fort street. The building will be two stories, of brick construction and will cost about \$4,000.

The Wyandotte Sheet Metal Works, Wyandotte, Mich., has been incorporated with \$2,000 capital stock for the manufacture of sheet metal specialties. H. T. Peters and John Meyers are among those interested.

The Board of Public Works, Benton Harbor, Mich., has recommended the appropriation of \$26,000 for enlarging and improving the equipment of the municipal lighting plant. It is expected that the expenditure will be approved by the City Council and work started at an early date.

The Chippewa Engine Works, Sault Ste. Marie, Mich., will shortly begin the construction of a new plant. The building and its equipment will be modern in every respect.

The Water Board of Saginaw, Mich., has decided to advertise for proposals for a feed water heater and purifier, a filter and pumps for the boilers for the east side pumping station.

The White Printing Company, Grand Rapids, Mich., will build an addition to its plant 50 x 50 ft. and three stories.

The Grand Rapids Molding Company, Grand Rapids, Mich., has taken out a permit for the erection of a one-story cement factory building on South Division street, to cost \$2,500.

It is reported from Ludington, Mich., that the M. Reichardt Company, Chicago, has completed negotiations for the establishment of a piano factory in that city. It is stated that the company will occupy the three-story factory formerly used by the Hamilton Mfg. Company.

The Saginaw Sandstone Brick Company, Saginaw, Mich., is making extensive improvements to its plant, including the installation of a new engine, a press and a considerable amount of miscellaneous machinery and will about double its capacity.

P. W. Prentice, Bay City, Mich., has acquired a site of five acres at West Branch, Mich., improved with a factory building, and will establish a plant for the making of potash.

The H. B. Arnold Company, Saginaw, Mich., has been organized, with \$25,000 capital stock and will engage in the manufacture of furniture and office appliances. H. B. Arnold is the principal stockholder.

The Battle Creek Oven Rack Company, Battle Creek, Mich., has been reorganized as the United Wire & Steel Company and will erect two new manufacturing buildings, one 35 x 120 ft., and one 30 x 30 ft. The company manufactures a line of oven racks and is the owner of a patented process of electric welding.

The Duplex Power Company, Charlotte, Mich., manufacturer of automobiles, has been placed in the hands of a receiver. The receiver, F. P. Town, is un-



certain as to whether the business will be continued or the plant shut down.

The American Steam Pump Company, Battle Creek, Mich., is expanding its line of products and will soon place on the market a full line of direct air compressors, both single and two stage. The company's plant is reported to be operating to nearly full capacity in all departments.

The Saranac Machine Company, St. Joseph, Mich., has announced that it will move its plant to Benton Harbor, Mich., where a new building to cost about \$15,000 will be erected. The company's facilities will be enlarged about one-third.

It is definitely announced that the Kindel Bed Company of Chicago will establish a branch plant in Grand Rapids, Mich. The plans call for an investment in buildings and equipment of approximately \$100,000.

The Petoskey Block & Mfg. Company, Petoskey, Mich., whose plant was recently destroyed by fire, has had plans prepared for a new building and is now ready for its equipment which consists of a coil top engine of 125 to 150 hp. and a complete line of wood working machinery.

The Wyandotte Foundry Company, Wyandotte, Mich., is rebuilding its plant recently destroyed by fire at a cost of \$25,000. The new building will be 100 x 140 ft. and of steel and concrete construction.

The Fisher Body Company, Detroit, Mich., has been issued a permit for the erection of a five-story brick factory to cost \$65,000.

The Diamond Mfg. Company, Detroit, Mich., will build a two-story reinforced concrete factory at 261 Artillery street, at a cost of \$72,000.

The Robinson Automatic Machine Company, Detroit, Mich., is building a one-story brick factory in that city to cost \$1200.

## The South

LOUISVILLE, Ky., April 30, 1912.

Comparative quiet has characterized the machinery trade in this section in the past week, reports of only fair business being the rule. The outlook is for trade to continue in about the same condition for some time to come. Inquiries are not numerous, and while some business is being placed, few large contracts are being figured. Heating and power plants for large buildings are productive of as much business as any other factor just now. Special machinery for factories is not in as brisk demand as it was a few weeks ago. Public service companies are still asking for quotations on scattering installations, but the number and size are probably less than heretofore.

Manufacturers of large tractors report that the South, which heretofore has been only a small consumer of power-driven farm machinery, is showing more interest in equipment of this character, and may be expected to take hold of power tractors to a larger extent in the near future.

Joseph & Joseph, Louisville, are receiving bids on the erection of the 11-story reinforced concrete office building of the Varble & Frazier Company in this city. A heating plant will be installed. Both general and detail bids are being received. Joseph & Joseph will also let a contract for the installation of a heating plant in the new tuberculosis hospital at Waverley Hills, near Louisville, the cost of which will be about \$4,000.

The Louisville Drying Machine Company is looking for active trade in the next few months from the distilleries, which have about concluded their active season and will make improvements during the summer months. This will give coppersmiths and other manufacturers catering to the distillery trade plenty to do.

The Louisville Water Company is figuring on enlarging its filter plant. Special equipment of various kinds will be needed, but detailed plans have not yet been made. Theodore Leisen is chief engineer of the company.

F. H. Miller, superintendent of motive power of the Louisville Railway Company, is completing plans for the new power-house which will be built at Twenty-eighth and High streets. Much of the machinery to be installed there has been contracted for.

The Louisville Lozier Company has started in business with temporary quarters at 708 West Broadway. Howard Lothrop is in charge. The concern will establish permanent quarters, with a well-equipped repair shop, in the next few weeks. H. K. Martin will be in charge of this.

The Colonial Creosoting Company has been incorporated in Louisville with \$100,000 capital stock for the purpose of establishing a plant for treating railroad ties at Bogalusa, La. A. T. Hert, of the American Creosoting Company, with headquarters in Louisville, is president of the new company.

The Louisville Cooperage Company, of which Nicholas White is president, is erecting a building which will be used for finishing staves. Wood-working equipment of various kinds will be needed. Probably it will be motor-driven.

John P. Starks, Louisville, who planned to erect a 6-story mercantile building at Fourth and Walnut streets, Louisville, has changed his plans and will build a 14-story steel-frame building instead, which will be used for office and store purposes. Daniel H. Burnham, Chicago, and McDonald & Dodd, Louisville, are drawing the plans for the building, the estimated cost of which is \$600,000.

No bids on the property of the American Automobile Company, of New Albany, Ind., which is in the hands of a receiver, have been submitted, but the American Automobile Corporation is being formed for the purpose of arranging a settlement with creditors, who include machinery manufacturers, and putting the plant in operation again. The liabilities of the company amount to about \$30,000.

B. V. Brown, Louisville, and H. E. Beck, Bowling Green, Ky., are planning the establishment of an industrial school at Elizabethtown, Ky. They also propose to build a canning factory.

H. D. Fitch, Bowling Green, Ky., manager of the Kentucky Public Service Company, is purchasing additional machinery for the electric light plant there. It is stated that the backers of the public service company are Montgomery, Clothier & Tyler, of Philadelphia. The latter have purchased the property of the Clarksville Railway & Light Company, Clarksville, Tenn., and expect to improve it as they have been doing with their newly acquired Kentucky plants. The gas plant at Bowling Green is to be improved following the purchase of a new franchise which has just been created by the City Council.

The Fooks Lumber Company, Paducah, Ky., is contemplating making improvements in its planing-mill.

The flour mill of Charles Noonan, Fulton, Ky., was burned April 23, the loss being \$20,000. It is stated that it will be rebuilt in the immediate future.

A broom factory is to be established in Georgetown, Ky., by William Daugherty.

Henderson, Ky., will issue bonds for the construction of a filter plant. Joseph K. Lockett and Henry N. Vogel are members of the water board.

Henry Humkey, Lebanon, Ky., is building a carriage factory. Wood-working and metal-working machinery will probably be needed.

A heating plant will be installed in the county courthouse at London, Ky. Address the fiscal court.

J. J. Cozatt, Parkesville, Ky., is spending \$20,000 in the erection of a flour mill and elevator, which will replace a plant which recently burned. Machinery will be contracted for in the near future.

The R. M. K. Flour Company, Livingston, Ky., is erecting a mill. It has been incorporated with \$12,000 capital stock by John H. Walton, Mary Krueger and others.

The Harris Limestone Company, Glasgow, Ky., is in the market for rock-crushing machinery. The proposed plant will have a capacity of 50 tons a day.

It is reported that the Oliver Chilled Plow Works, South Bend, Ind., has purchased from the Wisconsin Steel Company 15,000 acres of coal and timber lands in Harlan County, Ky., and will develop the property in the near future.

A large loose-leaf tobacco warehouse will be erected at Maysville, Ky., by R. L. Crisp, C. M. Jones, C. W. Payne and others. The building will be 160 x 300, and will be equipped with power machinery, presses and equipment for handling material. The probable cost is \$50,000.

The United American Insurance Company, Frankfort, Ky., will erect a seven-story reinforced concrete office building in that city. C. W. Bell is president of the company.

The Kentucky Portland Cement and Coal Company has been incorporated in Baltimore, Md., with \$1,200,000 capital stock to open coal mines and erect a cement mill near Pine Hill, Ky. E. M. Newton, Baltimore, is president of the company, and John E. Dreisbach, Baltimore, is engineer.

## Indianapolis

INDIANAPOLIS, IND., April 30, 1912.

The J. E. Hall Company, Indianapolis, has been incorporated with \$25,000 capital stock, to do a general construction business. The directors are J. R., C. E. and J. E. Hall.

The Alerding-Ittenbach Company, Ft. Wayne, Ind., has been incorporated with \$15,000 capital stock, to manufacture novelties and trunks. The directors are Leo J. Alerding, L. J. Ittenbach and L. Ittenbach.

The United States Match Company, Elkhart, Ind., has increased its capital stock from \$165,000 to \$250,000.

The Showers Bros. Company, Bloomington, Ind., furniture manufacturers, has increased its capital stock from \$500,000 to \$750,000.

The officers of the Traction Appliance Company, Vincennes, Ind., recently organized are: President, Fred C. Morgan; vice-president and general manager, George E. Henry; secretary-treasurer, Joseph J. Risch. The company is incorporated with \$25,000 capital stock and among the appliances to be manufactured are trolley wheels, electric controllers and duplex brake holders.

The United States Corrugated Fiber Box Company, Indianapolis, has been incorporated with \$25,000 capital stock, to manufacture shipping cases. The directors are H. J. Lacey, R. J. Hauser and J. B. Fitch.

The Northern Indiana Mausoleum Company, Ft. Wayne, Ind., has been incorporated with \$50,000 capital stock, to build mausoleums. The directors are Wm. M. McKinnie, R. L. Magee, H. G. Keegan, A. L. Craig and E. T. Tucker. The American Furniture Company, Lawrenceburg, Ind., will spend \$35,000 in buildings and remodelling its plant.

The M. Rumely Company, Laporte, Ind., has increased its force over 1000 and has been operating its plant night and day for a year. Additional factory buildings will be built, to cost \$200,000, the plant built two years ago, costing \$1,000,000 having been found inadequate.

The Baltimore & Ohio Railroad has awarded the contract for the erection of two additions to its machine shop at Washington, Ind., to cost \$35,000, and additional improvements to the roundhouse at that point will be made at a cost of \$25,000.

The Brazil Machine & Foundry Company, Brazil, Ind., has begun the erection of a large addition to its plant.

## St. Louis

ST. LOUIS, MO., April 29, 1912.

The developments of the week in the machine tool market have not been of an exciting sort. Business continues on the even tenor of its way, with no disturbing features and no exceptional elements of either encouraging or discouraging character. Single tools for new work, replacement orders in small quantity and some demand for second hand tools are the sum total of business with a fairly satisfactory state of affairs as relates to collections. The uncertainties of the presidential year, however, are regarded as the chief restraining influence preventive of real activity.

The King Foundry Company, St. Joseph, Mo., has increased its capital stock from \$15,000 to \$25,000 for the purpose of enlarging its plant.

The Teuscher & Son Machinery Supply Company, St. Louis, has bought a large tract of land for a new plant to be erected near the new bridge across the Mississippi at St. Louis, nearing completion.

The oil refineries at Vinita and Chelsea, Oklahoma, were destroyed by fire the past week with \$150,000 loss. They will be rebuilt and new machinery installed.

The Union Sample Case Company, St. Louis, with \$10,000 capital stock, has been organized by L. C. and A. H. Toennies, Paul Schokore, C. F. Koch and E. E. Meyer to equip a plant for the manufacture of drummers' sample cases of patented design.

The Northern Ice Company, Kansas City, Mo., with \$100,000 capital stock, has been incorporated by D. McConnell, H. Blocherger and B. F. Deatherage to equip an ice manufacturing plant.

The plant of the Henry Quellmalz Lumber & Mfg. Company, St. Louis, was destroyed by fire with a loss of \$60,000 the past week. The buildings will be rebuilt and new mechanical equipment installed.

H. L. and Jos. Griesedieck, St. Louis, have purchased the Western Brewery plant at Belleville, Ill., and will modernize its mechanical equipment and place it in operation again.

Construction work has been begun on the power house for the 21-story Railway Exchange Building at St. Louis. The power house and the mechanical equipment will be situated a block away from the main building and will be very complete in its arrangements.

The Farra Pump & Machinery Company, St. Louis, has been incorporated with \$72,000 capital stock, by J. P. Sweeley, Christy M. Farrar and A. V. Jennings to equip a plant for the manufacture of pumps, and similar machinery.

The No-Rub Mfg. Company, Kansas City, Mo., with \$50,000 capital stock, has been formed by J. C. Mars, H. G. Smyth and M. Mars to establish and equip a manufacturing plant.

The Charles F. Bassen Woodworking Company, Hannibal, Mo., with \$40,000 capital stock has been organized, by C. F. Bassen, G. W. Clayton and G. B. Treat and will equip a woodworking plant with machinery at once.

The Missouri Crushed Rock Company, Kansas City, Mo., with \$100,000 capital stock has been incorporated by S. R. Feist, R. E. Weesner and F. C. Kaempff to install a large rock-crushing plant.

The St. Louis Lightning Rod Company, manufacturer on a large scale of lightning rods and similar apparatus, had its plant destroyed by fire the past week. It will be rebuilt and re-equipped at once.

The Union Electric Light & Power Company, St. Louis, is completing plans for the construction of a large transforming station in the St. Louis suburbs to transform the 60,000 hp. in high tension current which it will receive from the hydro-electric plant at Keokuk, Ia., upon its completion.

The London Mfg. Company, Jackson, Mo., with \$30,000 capital stock, has been organized to equip a plant. The incorporators are J. A. Berry, E. C. Berry and R. J. London.

The Farmers' Elevator Company, Craig, Mo., has been incorporated with \$10,000 capital stock, by Roger McCoy, S. M. Randall and E. R. Melton to install a grain elevator.

The St. Clair Hosiery Mills, Belleville, Ill., with \$12,000 capital stock, will be established by C. J. Nagel, Philip Knapp and Peter Fellner, as soon as mechanical equipment can be placed.

The plant of the Atlas Leather Company, Caseyville, Ill., was destroyed by fire last week. It will be rebuilt and re-equipped with machinery.

The Continental Radiator & Foundry Company, St. Louis, Mo., has leased the building formerly occupied by the Reliable Foundry, at Fort Madison, Iowa, to be used as a radiator plant and machinery will be installed at once.

The Kansas Gas & Electric Company, Newton, Kan., has completed plans for the rebuilding of a power plant at that place, involving the expenditure of \$10,000 for new boiler and steam turbine equipment.

## Texas

AUSTIN, TEXAS, April 27, 1912.

One effect of the unusually good prospects for a large cotton crop in Texas is the increased demand for cotton ginning machinery. New gins are being installed in many localities and before the harvesting of the cotton crop begins there will be more plants of this kind erected. A number of new cotton compresses are also being planned. Business conditions generally are very satisfactory.

Z. T. Norwood of Wildorado is preparing to erect a factory at Plainview for the manufacture of tile which will be used for sub-irrigation.

It is announced by Mayor William Lusk, of Brenham, that a syndicate of Ann Arbor, Mich., men which recently obtained a franchise for installing a gas manufacturing plant and distributing system in that town has its arrangements nearly finished for beginning the construction work.

The Fort Worth Marble and Granite Works has been organized at Fort Worth with a capital stock of \$40,000. The incorporators are George A. Tumlin, Sidney M. Harrison, W. B. Harrison and Lee Sherrell.

The Farmers Gin Company, Abbott, Texas, has been organized with a capital stock of \$10,000. The incorporators are O. D. Greenhill, R. H. Hooker and J. R. Tinsley.

The Farmers & Merchants Gin Company, Irene, has been organized, with a capital stock of \$6,000. The incorporators are R. C. Burns, J. A. Merrell and T. M. Biggers.

George L. Caldwell will erect a cotton gin at Robstown, Texas, at a cost of \$10,000.



It is announced by J. W. Crotty of Dallas, vice-president of the East Texas Traction Company, that the contract for the construction of its proposed inter-urban electric railway from Dallas to Greenville has been awarded to the Mansfield Engineering Company which is preparing to assemble its equipment preparatory to beginning construction work.

W. C. Burke of Oklahoma City, Okla., has made a tentative proposition to the City Commission of Dallas, for the installation of a sewage disposal plant in which an electric process will be used. The matter is under consideration by the City Commission.

M. M. Cherry of Dallas and associates are arranging to erect an oil refinery at Texarkana, at a cost of \$500,000 to \$1,500,000. The oil to supply the plant will be piped from the Caddo, La., field.

At the recent election of tax-payers of Henrietta the proposition of issuing \$18,000 of waterworks bonds was carried.

The Dealers Ice & Cold Storage Company is installing an ice factory at Miami, Ariz.

The Texas Company, which has its headquarters at Houston, is developing a large supply of natural gas near Moran. It has already piped the gas to Albany, 17 miles, and is preparing to lay pipe lines to Cisco, Putnam, Baird and Abilene.

V. B. Colley of Smiley will install an ice factory and an electric light plant at Stockdale.

The Kingsville Co-operative Creamery Company has been organized at Kingsville, with a capital stock of \$3,000. W. B. McCracken is president.

The Lone Star Brewing Company, San Antonio, has increased its capital stock to \$825,000 from \$500,000. It will make important improvements.

Wm. C. Clark is preparing to install an electric power and lighting plant at Sylvan Beach. He will also install an ice factory and waterworks plant at Sylvan Beach.

The municipal electric light, power and waterworks plants and distributing system at San Angelo have been purchased by A. E. Pitkin & Co., of New York, for \$400,000. The new owners will make improvements to the property.

Hans & Sons, Cairo, Ill., and Sherman, Texas, will establish a large plant at Houston for the manufacture of shovel handles.

The Somerville Ice Company will install additional machinery in its ice factory at Somerville.

The Cuauhtemoe Brewing Company, Monterey, Mexico, is preparing to enlarge and greatly improve its plant. It will install additional machinery in its ice factory and cold storage plant and will remodel and enlarge its bottling department. It will also equip its boilers with crude oil burners. The total cost of the proposed improvements will exceed \$500,000, it is announced. The Alfred Giles Company, of San Antonio and Monterey, is the architect that is preparing the plans and specifications for the proposed improvements.

## The Pacific Coast

PORTLAND, ORE., April 23, 1912.

Labor troubles are less acutely felt along the Washington coast, but the situation is still unsettled and considerable business, both in mill equipment and other lines of machinery, is believed to be held up on this account. Both in machine tools and woodworking machinery current business is mostly of an ordinary routine nature, with few single inquiries of any importance, though scattering orders from the interior are becoming a little more numerous. Implement manufacturers of eastern Washington and Idaho are very busy and a marked revival of smelter operations is reported in Montana. In eastern Oregon there is considerable inquiry for waterworks and irrigation equipment, and plans are under way for a number of large electric installations. The use of electrical mill equipment is steadily increasing.

It is reported that the Southern Pacific Railroad is preparing to electrify a number of its lines in the vicinity of Portland, though so far no definite information is available.

The Chicago, Milwaukee & Puget Sound Railway will start work May 1 on its three-mile tunnel through the Cascade mountains. This road plans a large increase in its Tacoma, Wash., car shops.

The Northwestern Electric Company has plans about completed for an extensive power development on the Lewis, Klikitat and White Salmon rivers, with an extensive distributing system in western Washington and Oregon.

The town of Chehalis, Wash., is taking figures on a lot of contractors' and testing equipment.

The Inland Navigation Company, Seattle, Wash., is taking figures on the construction of a steel steamer to carry 1200 passengers, with a speed requirement of 19 knots.

A. H. Anderson, Seattle, Wash., is having plans drawn for a 125-ft. steel gasoline yacht.

The West Coast Ornamental Iron & Wire Works has been incorporated at Seattle, Wash., with a capital stock of \$2,000, by E. T. Lundvall and F. J. Norman.

The Cherry City Milling Company is preparing to install a flour mill at Salem, Ore., at a cost of about \$20,000.

The Crown Columbia Paper Company, with mills at Oregon City, Ore., and Camas, Wash., announces the placing of an order for a new paper machine, said to be the largest in the world. All the machinery at the Camas plant is being equipped with electric power. This company has also ordered a lot of electrical equipment for its mill at Floriston, Cal.

The Hammond Lumber Company, having extensive interests in Oregon and California, has plans about ready for a large sash and door factory at Los Angeles, Cal.

C. H. Feigenbaum, operating as the Index Shingle Mill, Index, Wash., is preparing to install four to six upright shingle machines.

The Modesto Iron Works, Modesto, Cal., has purchased a site at that place and will install an implement factory.

## Eastern Canada

TORONTO, ONT., April 27, 1912.

The principal features of trade are as sharply defined as ever. The demand is good, works are kept busy, labor is scarce, and the prospects are particularly bright. The continued inrush of immigrants, the expansion of railroad enterprise, the abundant offerings of capital and the opening up of new industries are very assuring for the immediate future. The diversification of industry proceeds rapidly. Canadian total external trade in the fiscal year added with last month amounted to \$847,372,739, which is \$93,000,000 more than that for the fiscal year immediately preceding. The current year is expected to show an equal increment. The trade with the United States was more than half the total, and the imports from the United States alone amounted to \$350,000,000.

Herbert Hall, manager of the Canadian Conduit Company, Toronto, J. S. Saunders, Walter Reeves, and other Toronto men have organized a company to manufacture six-cylinder motor cars in Toronto. The capital stock is \$200,000.

Sheldons Ltd., Galt, Ont., contemplate the building of an additional foundry and a machine shop. The company manufactures fans and blowers of all kinds, and certain types of steam engines.

The City Council of Fort William, Ont., has approved the agreement between the local Industrial Bureau and the Canada Car & Foundry Company for the establishing of a \$1,000,000 plant in the city. The company agrees to put up a plant of that value, wherein will be manufactured passenger cars, steel and wood freight cars, and such car specialties as brake beams, couplings, axles, springs, etc. The capacity of the plant will be 24 freight cars and one passenger car per week and 30,000 axles per year. It is to be completed thirty months from the time of the beginning of construction. For the first five years 1000 men will be regularly employed. The city is to give a site of seventy acres to cost \$230,000 and to give \$20,000 in cash. There is also to be exemption from general taxation, and any streets on the property will be closed. The Canada Car & Foundry Company has large plants in Amherst, N. S., and in Montreal, and does about 80 per cent. of the car-building in Canada.

It proposes to have its Fort William plant in operation by October, 1913.

The Edwardsburg Starch Company, L'Original, Ont., proposes to build a large branch plant in Fort William, Ont., to cost \$350,000.

The factory of the Toledo Scale Company, at Windsor, Ont., will, it is stated, be enlarged.

The Dominion Steel Castings Company has received letters of incorporation from the Dominion Government to carry on business with a capital stock of \$300,000, its head office to be in Toronto.

The Campbell Steel & Iron Works, Ltd., has received Dominion incorporation with a capital stock of \$100,000, its head office to be in Ottawa.

The Dominion Safety Explosive Company is building a plant at Cobalt, Ont.

By-laws have been approved by the ratepayers of Stratford, Ont., to make a municipal guarantee of small bond issues of the following parties, which will establish manufacturing industries there: G. L. Griffith, of Melbourne, Ont., who will establish a harness factory; Ben Williams, Stratford, who will establish a knitting factory; the MacDonald Thresher Company, which will establish a plant to manufacture threshers.

Fire damaged the premises of the Standard Sanitary Mfg. Company, Toronto, to the amount of about \$10,000.

The Pratt & Letchworth Company, Buffalo, or an interest connected with that company, is negotiating for the establishment of a branch factory in Hamilton, Ont. A site is reported to have been obtained. Steel castings for locomotives and cars are to be manufactured. Mr. Wheatley, general manager of the Canadian Locomotive Company, Kingston, Ont.; Mr. McNaughton, Montreal; Mr. Verity, of the Verity Plow Company, Brantford, Ont.; and John Taylor, of the John Taylor Mfg. Company, Toronto, are mentioned in connection with the project.

The Gunn-Langlois Company, Montreal, has purchased a 5-acre site in Clinton, Ont., on which to erect a large plant.

Fire partially destroyed Robinson Bros.' cork factory at Port Colborne, Ont.

The Toronto & Niagara Navigation Company, Toronto, has been incorporated with a capital stock of \$2,000,000.

With the conclusion of the expropriation proceedings between the Hydro-Electric Commission and the owners of the Chats Falls Powers, on the Ottawa River, the Commission's engineers will focus their attention upon the construction of a power plant which will probably equal that of the Ontario Power Company at Niagara Falls, the source of current for the Commission in Western Ontario.

The Toronto & Niagara Power Company intends to build a structural steel plant at the northeast corner of Shaw and Dupont streets, Toronto.

George J. Bury, vice-president and general manager of the C. P. R. Company, has just been in conference with the heads of the company in Montreal, and announces that \$22,000,000 is to be expended upon rolling stock by the company.

## Western Canada

WINNIPEG, MAN., April 25, 1912.

Spring has opened in a gratifying way in western Canada and conditions of late have been very favorable for outside work. Industrial expansion which has until recently appeared largely on paper has now made a good start. Contractors are engaged on the foundation work of large buildings of different kinds. The construction of many buildings for manufacturing plants is under way and a busy season in this respect is assured. Seeding has been general in the prairie provinces for a week, the work being as early as the average for these provinces, with soil conditions better than in many previous spring seasons. Prosperity is evident on every hand and confidence prevails all through the country. There is a healthy tone in commercial and industrial circles.

The Ontario & Manitoba Flour Mills, Ltd., has signed an agreement with the city of Regina, Sask., to build there a flour mill of 2000 barrels capacity; also grain elevators with total capacity of about 200,000 bushels. The company has a mill at Sudbury, Ont., and the head offices are in Ottawa.

The Pioneer Traction Company, Winona, Minn., manufacturer of traction engines, has decided to establish a branch factory in Calgary, Alberta. The cost is placed at \$250,000.

D. Ackland & Son, Ltd., Winnipeg, manufacturers of carriage goods, are increasing the capital stock from \$100,000 to \$500,000. The plant will be enlarged considerably.

The City Council of Moose Jaw, Sask., has passed a resolution to assist the Moose Jaw Pressed Brick Company, a new industry starting there.

Tenders will shortly be called for in High River, Alberta, for a power house, machinery and sewage disposal plant. It will include various waterworks machinery and fixtures. The secretary of the town is G. E. Mack.

Plans have been prepared for a public abattoir at Calgary, Alberta, under the name of the Calgary

Abattoir Company. The architects are Craig & Major.

Plans are being prepared for a 10-story office and store building in Calgary for Hon. J. A. Loughheed of that city.

The Laurentia Milk Company, Toronto, contemplates establishing a large dairy plant near Saskatoon, Sask.

The Saskatchewan Sewer Pipe & Brick Company, Ltd., Estevan, Sask., has been incorporated with a capital stock of \$225,000. It will manufacture the lines the name indicates.

The contract for a new electrical unit in the power house of Kenora, western Ontario, has been let to the Allis, Chalmers & Bullock Company, Montreal. It will mean the addition of 830 hp. to the plant.

The Canadian Pacific Railway Company has let a contract to Barret & McQueen, Fort William, for the erection of a 1,000,000-bushel transfer elevator in the company's yards at North Transcona, Man. The work will start right away.

Work will start this summer on a railroad to the properties of the Alberta and the Canada iron syndicates, 25 miles west of Okotoks, Alberta, and when the railroad is finished ore will be mined and probably a furnace built. The whole project involves an expenditure of about \$5,000,000. P. Burns, Calgary, Alberta, is behind the venture.

Mutchenbacher Bros., whose large sawmills at Swan River, Man., were burned last fall, will establish their new plant at Portage la Prairie, where extensive mills will be built for them. One hundred men will be employed in the new mills.

The British Canadian Company's new lumber mill, now in course of erection at New Westminster, B. C., will, it is said, be the most modern in Canada. The installation of machinery has begun. Four hundred men will be employed in its operation.

The work of building the huge dry dock and the wharves the Grand Trunk Pacific Railway Company is constructing at its Prince Rupert terminal point on the Pacific is on the point of beginning. The company that has the contract is getting its men on the ground.

Taylor & Young, Vancouver, B. C., are about to launch extensively into the business of building motor boats.

Dr. J. K. McLennan, Edmonton, Alberta, general manager of the Edmonton, Dunnegan & British Columbia Railway Company, announces that the steel for 100 miles of the road has been contracted for with a United States steel corporation.

## Government Purchases

WASHINGTON, D. C., April 29, 1912.

The United States Engineer's office, New London, Conn., will open bids June 7, for furnishing and installing an internal combustion engine plant at El Fraile Island, P. I.

The office of the supervising architect, Washington, will open bids May 6 for an oil burning plant for heating boilers in the United States Post Office, Stockton, Cal.

The chief of ordnance, United States Army, Washington, opened bids April 18 for furnishing one Everett-McAdam continuous electric blue-printer as follows:

Keuffel & Esser, Hoboken, N. J., \$472.50; C. F. Pease Company, Chicago, Ill., \$1,075 and \$1,175; Fred A. Schmidt, Washington, D. C., \$1,370 and \$1,310, alternate; Revolute Machine Company, New York, \$1,440.

The Reclamation Service, Los Angeles, Cal., opened bids April 12 for induction motors for the Rio Grande project as follows:

Wagner Electric Mfg. Company, Los Angeles, Cal., \$2,734.15; Fairbanks-Morse Company, Los Angeles, Cal., \$2,031.70; Gen. Electric Company, Los Angeles, \$2,128; Western Electric Company, Los Angeles, \$2,334; Westinghouse Electric & Mfg. Company, Los Angeles, \$2,125; Allis-Chalmers Company, Los Angeles, \$1,900; Crocker-Wheeler Company, Los Angeles, \$2,213.

The Reclamation Service, Los Angeles, Cal., opened bids April 13 for centrifugal pumps for the Boise project as follows:

Byron Jackson Iron Works, Los Angeles, Cal., \$1,252; Kropp Mfg. Company, San Francisco, Cal., \$1,342.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids April 23 for supplies for the navy yards as follows:

Schedule 4433, class 71, one Everett-McAdam continuous blue printer—Bidder 70, Keuffel & Esser Company, Hoboken, N. J., \$472.50; 108, C. F. Pease Company, Chicago, Ill., \$1,575 and \$1,475; 116, Revolute Machine Company, New York, \$1,860; 121, F. A. Schmidt, Washington, D. C., \$1,750.

Schedule 4436, class 101, one automatic railway cut-off saw, motor driven—Bidder 3, American Wood Working Machinery Company, Rochester, N. Y., \$592; 49, J. A. Fay & Egan Company, Cincinnati, Ohio, \$485.20; 55, Greenlee Bros. & Co., Rockford, Ill., \$580 and \$671; 160, Manning, Maxwell & Moore, New York, is formal.



